The IRON AGE

January 21, 1960 A Chilton Publication The National Metalworking Weekly

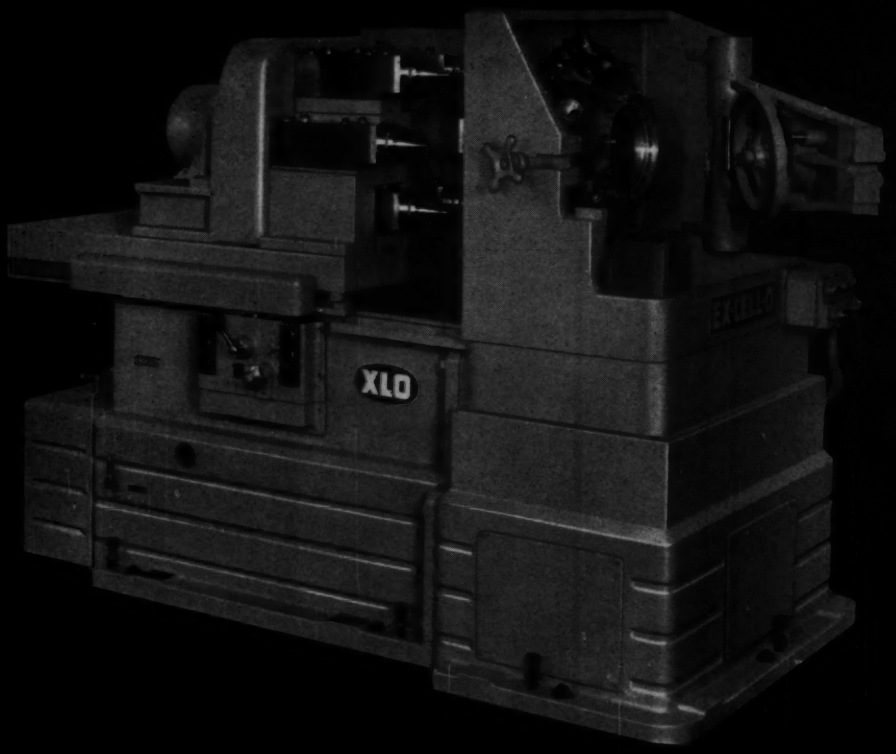
Fairbanks Whitney's Karr Sees

More Sales, Higher Profits in Europe's New Markets P. 43

Scrap Industry Maps Plans for Survival – P. 48

Pre-Refined Iron Ups Electric Furnace Output – P. 81

Digest of the Week – P. 2-3



An Ex-Cell-O Way-Type unit can be a special-purpose production machine, or used with other units as an automated machining line. Various arrangements are outlined below.

59-21

Ex-Cell-O Way-Type units use standard components for economy, flexibility...

Ex-Cell-O Precision Way-Type Machines let you arrange and re-arrange combinations of standard machine components to create your own special machines for each new job. A self-contained Way unit consists of a base, a slide, and hydraulic power and controls to operate the slide; a universal end section supports the work fixture.

The typical single-unit Way Machine above bores and chamfers six holes at one feed stroke in a magnesium aircraft component. Hole locations are held to .001″ tolerance, and finish bore diameters are accurate within plus or minus .0005″.

Your local Ex-Cell-O Representative will welcome the opportunity to suggest other profitable Way Machine applications in your operation. Call him, or contact Ex-Cell-O, Detroit.

EX-CELL-O FOR PRECISION XLO

EX-CELL-O CORPORATION
DETROIT 32, MICHIGAN
Machinery Division

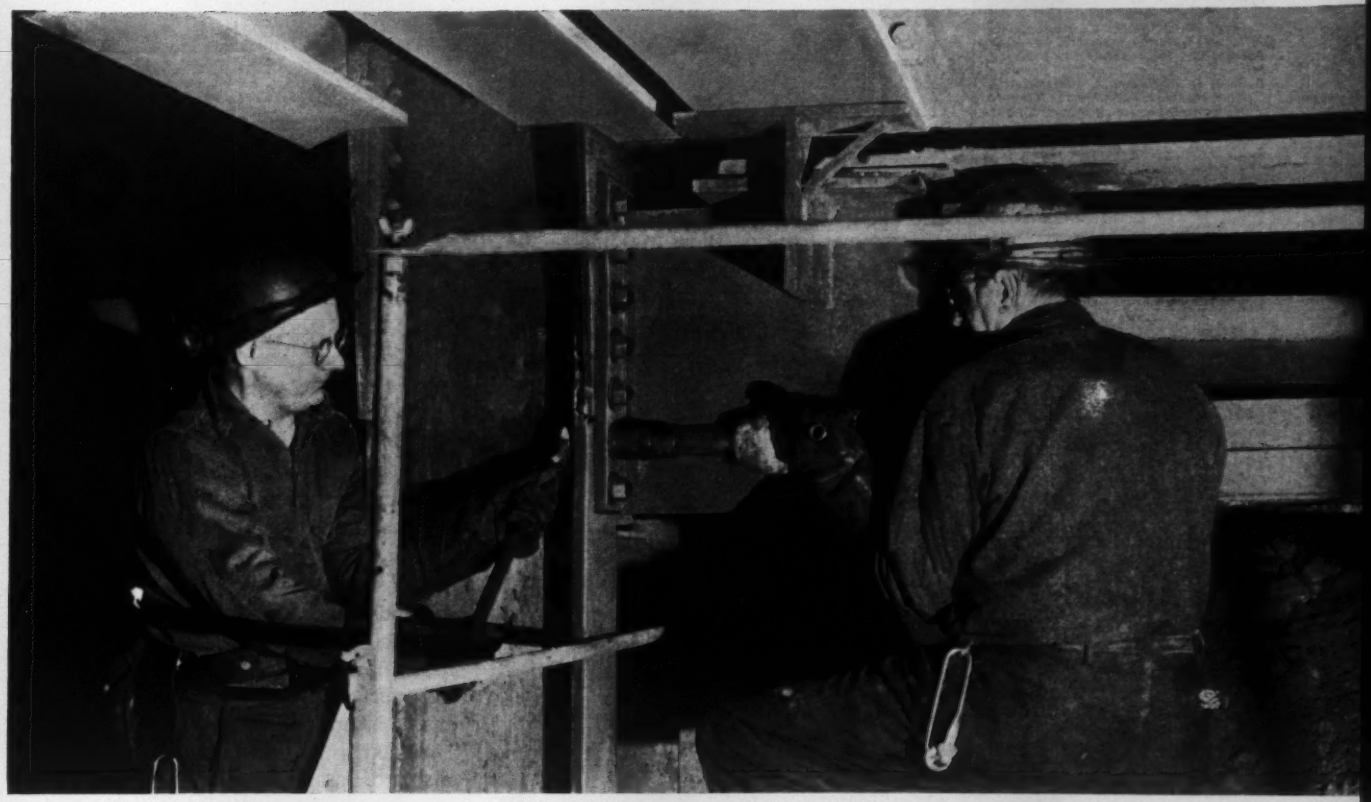
EX-CELL-O PRECISION PRODUCTS INCLUDE: MACHINE TOOLS • GRINDING AND BORING SPINDLES • CUTTING TOOLS • RAILROAD PINS AND BUSHINGS • DRILL JIG BUSHINGS TORQUE ACTUATORS • THREAD AND GROOVE GAGES • GRANITE SURFACE PLATES AIRCRAFT AND MISCELLANEOUS PRODUCTION PARTS • DAIRY EQUIPMENT

Refastening structural members?

TRY HIGH-STRENGTH BOLTS

▲*ONE WORKMAN burns off heads of loosened rivets while the other uses an air hammer to drive rivets from holes. Connection steel is cleaned as the rivets are cut loose with the oxy-acetylene torch.*

▼*TWO-MAN CREW tightens high-strength bolts in rehabilitated structural connection in Bethlehem's No. 2 Open Hearth Building. One man holds spud wrench while his partner uses pre-calibrated torque wrench.*



They go in fast, won't loosen.

Back in 1953, we installed high-strength bolts to strengthen the steel framing and crane run in one of our steel plant buildings. It's a tough test, since two 10-ton bridge cranes are in continuous operation. When these cranes start and stop, they set up severe side and lateral stresses on the structural members.

Before the bolts were installed, the riveted joints required frequent repair. But no more. Since 1953, we've checked these high-strength bolts for tightness at least once a year. *Not a single nut has loosened.* Joints stay put. Inspection and maintenance costs are a good deal lower than they used to be.

In addition to savings in maintenance, high-strength bolts offer welcome savings in installation. They go in fast. Try them next time you're refastening structural members. Bethlehem supplies a full size range. Each bolt meets the requirements of ASTM Specification A-325.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.
Export Distributor:
Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

THE IRON AGE
Chestnut and 56th Sts.
Philadelphia 39, Pa., SH 8-2000
GEORGE T. HOOK, Publisher

EDITORIAL STAFF
TOM C. CAMPBELL, Editor-in-Chief
GEORGE F. SULLIVAN, Editor
Managing Editor E. C. Beaudet
News Editor R. D. Raddant
Technical Editor J. J. Obrzut
Asst. News Editor H. R. Neal
Asst. Tech. Editor T. P. Plimpton
Machinery Editor R. H. Eshelman
Metallurgical Editor C. L. Kobrin
Nonferrous News Editor F. J. Starin
Art Director T. S. Paaby
Associate Editors: P. J. Cathey, R. R. Irving, W. N. Redstreake, Assistant Editor: M. J. Tatich. Regional Editors: K. W. Bennett, Chicago; T. M. Rohan, Cleveland; A. E. Fleming, Detroit; G. G. Carr, New York; R. R. Kay, Los Angeles; G. J. McManus, Pittsburgh; G. H. Baker, N. R. Regelmbal, R. W. Crosby, Washington. Correspondents: F. L. Allen, Birmingham; N. Levenson, Boston; R. E. Koebbe, St. Louis; J. Miller, San Francisco; R. Kazarian, Buffalo; D. R. Coughlin, Seattle; A. T. Collins, Houston; F. Sanderson, Toronto; F. H. Harley, London, England. Chilton Editorial Board: Paul Wooton, Washington representative.
Robt. Gunning—Readability Consultant

WASHINGTON EDITORIAL OFFICE
Washington 4....National Press Bldg.

BUSINESS STAFF
Production Manager Warren Owens
Director Research Oliver Johnson
Marketing Director R. H. Groves
Circulation Mgr. W. M. Coffey
Promotion Manager Richard Gibson
Asst. Research Dir. Wm. Laimbeer

REGIONAL BUSINESS MANAGERS
*Denotes editorial office also
Atlanta 3.....J. W. Sangston
32 Peachtree St., NE. Jackson 3-6791
*Chicago 1..T. H. Barry, W. R. Pankow
360 N. Michigan Ave. Randolph 6-2166
*Cleveland 15, R. W. Watts, R. L. White
930 B. F. Keith Bldg. Superior 1-2860
Columbus 15, Ohio...Harry G. Mumm
LeVeque-Lincoln Tower Capital 1-3764
Dallas 6.....W. J. Smyth
189 Meadows Bldg. EMerson 8-4751
*Detroit 2.....W. J. Mulder
103 Pallister Ave. Trinity 1-3120
*Los Angeles.....R. Raymond Kay
1920 Strand
Manhattan Beach Faculty 1-5306
*New York 17...C. T. Post, I. E. Hand
100 E. 42nd St. Oxford 7-3400
*Philadelphia 39—
B. L. Herman, J. A. Crites, W. E. Carr
Chestnut & 56th Sts. Sherwood 8-2000
*Pittsburgh 19.....T. M. Fallon
1707 Frick Annex Bldg. Atlantic 1-1830
San Francisco 3.....Don May
1355 Market St. UNderhill 1-9737
W. Hartford 7.....Paul Bachman
62 LaSalle Rd. Adams 2-0486
England.....Harry Becker
15 Gratton St., Altrincham, Cheshire
A Chilton Publication

CHILTON OFFICERS & DIRECTORS
G. C. Buzby, President
Vice-presidents: P. M. Fahrendorf, L. V. Rowlands, G. T. Hook, R. E. McKenna; Treasurer: W. H. Vallar; Directors: M. E. Cox, F. P. Tighe, E. B. Terhune, Jr., R. W. Case, Jr., C. A. S. Heinle, J. H. Kofron—Comptroller, Stanley Appleby.
Indexed in Applied Science & Technology Index and Engineering Index.

Copyright 1960 by Chilton Company

THE IRON AGE, published every Thursday by CHILTON COMPANY, Chestnut & 56th Sts., Philadelphia 39, Pa. Second class postage paid at Philadelphia, Pa. Price to the metalworking industries only or to people actively engaged therein, $5 for 1 year, $8 for 2 years in the United States, its territories and Canada. All others $15 for 1 year; other Western Hemisphere countries, $25; other Foreign Countries, $35 per year. Single Copies 50¢. Annual Review Issue $2.00. Cable: "Ironage," Philadelphia.

The IRON AGE

January 21, 1960—Vol. 185, No. 3

Digest of the Week in

★Starred items are digested at right.

EDITORIAL

The Big Squeeze: Or What Would You Do?

NEWS OF INDUSTRY

★Europe's Growing Markets 43
★Keep Your Eye on "Blow Molding" 46
★U. S. Opens Its Nickel Locker 47
★Scrap Industry Faces Challenge 48
★Steel Presses Product Identity 50
★The 1961 Fiscal Budget 51
The IRON AGE Salutes 55

FEATURE ARTICLES

★Pre-Refining Molten Iron 81
★Handling Safeguards 84
★Cold Extrude Stainless Shafts 86
★Faster Flat-Wire Output 88
★Burr Control Aids Stamping 90
Purifier Cleans Exhaust Fumes 93
Tube Bending Controlled by Tape .. 94
Measure Heat of Moving Steel 96

NEWS ANALYSIS

Newsfront 9
Report to Management 57
Automotive 59
★Washington 63
★West Coast 65
★Machine Tools 67

MARKETS & PRICES

Market Planning Digest 41
★The IRON AGE Summary 125
★Purchasing 126
Iron and Steel Scrap Markets 130
Nonferrous Markets 134

REGULAR DEPARTMENTS

Letters From Readers 11
Fatigue Cracks 13
Industrial Briefs 68
Men in Metalworking 71
Patent Review 98
Free Literature 103
Design Digest 106
New Equipment 116

INDEX TO ADVERTISERS 149

NEWS ARTICLES

PLASTICS BOOM

New Uses Grow—Blow molding of containers is one of the latest developments to push output of plastics to new records. And it has also created a vast new market for molds and dies. P. 46

ENOUGH NICKEL

For U. S. Consumers — Storm clouds that were forming disappeared when GSA announced it would put 35 million lb of stockpile nickel on the market. P. 47

SCRAP OUTLOOK

Good and Bad—The immediate outlook for the scrap industry is good. Based on strong export and high steelmaking operations, the industry is optimistic. But trends in steelmaking are toward a smaller charge of scrap. P. 48

PRODUCT IDENTITY

Steel Wants More of It—Steelmakers have started a drive to make sure consumers know products are built of steel. Campaign centers around a new, four-color symbol called the Steelmark. P. 50

THE BUDGET

In the Black—Early this week, the President sent his budget to Congress. How Congress reacts to possible surplus will be a key to legislative programs this year. P. 51

Metalworking

◀ COVER FEATURE

World Markets—Many authorities on world trade are convinced they have to manufacture in Europe to sell there. In this week's special report, Fairbanks-Whitney's David Karr (left) outlines company policies. W. F. Rockwell also gives views on world trade. P. 43

WASHINGTON

Return Visit?—The steel industry may be scheduled for another appearance before Sen. Kefauver again soon. His subcommittee has been keeping an eye on steel activities and some questions may have to be answered. One thing that will make their appearance certain is a price rise. P. 63

FEATURE ARTICLES

PRE-REFINE MOLTEN IRON

For the Electric Furnace—The openhearth is well suited for refining molten iron; the electric furnace is not. A new British steelmaking process solves this problem by pre-refining the hot metal with oxygen. The new technique speeds up and cheapens steelmaking in electric furnaces. P. 81

IMPROVED PACKAGING

Curbs Handling Hazards—Protection should be the main concern in packaging your products. A planned program insures maximum protection—and often reduces container size requirements. One government center maintains a four-week resident course to insure protection of military supplies. P. 84

COLD EXTRUSION

Of Stainless Shafts—Machining parts from stainless bar stock can be an expensive business. One successful way to handle the problem is with cold extrusion. A major manufacturer of outboard motors uses the process to produce its propeller and drive shafts. P. 86

CONTROLLING OUTPUT

On Flat-Wire Mills — As mill speeds increase, drive systems have to keep pace with fast moving changes. A new 60-ft long three-strand mill combines high operating speed, wide range of wire sizes and high rolling precision on both large and small wire sizes. P. 88

SHEET METAL STAMPING

New Aid—Effective burr control not only adds to quality of stampings, but gives burther benefits in equipment maintenance. It's done through preventive means and frequent resharpening of tools. One of the tricks is to control burr formation in the first place. P. 90

MARKETS & PRICES

FARWEST RE-BAR MARKET

Changes Are Due—Reinforcing bar fabricating is an $85 million business on the West Coast. But the industry has some tough problems. And changes are coming. P. 65

MACHINE TOOLS

Shift Coming — Passenger car makers are racing to beat each other to wide use of the aluminum engine. Special machines will be able to use both cast iron and aluminum in production. P. 67

STEEL SUMMARY

Key to the Market — Just how long the steel market remains tight depends on user inventory policies. If buildup levels off when shipments and stocks are in balance, the market will ease early this summer. Price uncertainty can contribute to greater accumulation. P. 125

PURCHASING

Good Year—Tool and diemakers see a good year ahead. One of the big boosts for work will come from the auto industry. P. 126

NEXT WEEK

AUTOMATED MACHINING

Making It Work—A close liaison between the machine builder and the user insures the greatest efficiency from automation. Next week's technical feature proves the value of such cooperation in a successful automatic transfer line.

How B&W JOB-MATCHED TUBING provides flexibility of design

Design with tubing — but be sure it's B&W because you can get:

- ... a choice of seamless or welded types to match your design requirements economically
- ... controlled mechanical properties which will simplify fabrication thus providing flexibility of design
- ... a complete size range for freedom of design with minimum fabrication costs

These are just a few of the reasons why it pays to specify B&W Job-Matched Tubing. Call your local B&W District Sales Specialist, or write for Bulletin TB-361 for full information. The Babcock & Wilcox Company, Tubular Products Division, Beaver Falls, Pennsylvania.

B&W

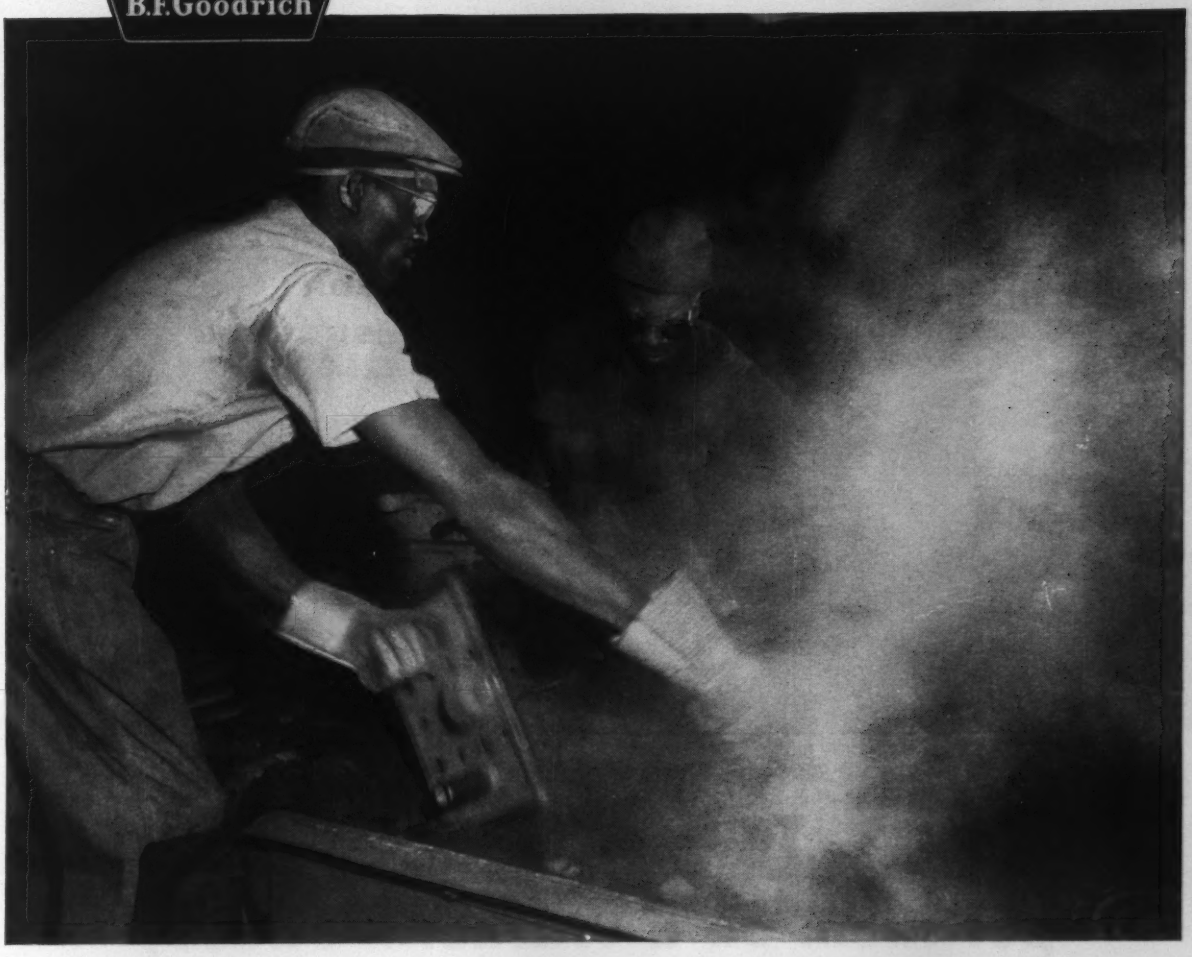
THE BABCOCK & WILCOX COMPANY

TUBULAR PRODUCTS DIVISION

TA-9030-Go

Seamless and welded tubular products, solid extrusions, seamless welding fittings and forged steel flanges—in carbon, alloy and stainless steels and special metals

B.F.Goodrich



Where belts carrying hot sand now last 50% longer

THOSE men are dumping hot sand from molds into a shake-out grid. The 250-degree sand falls through the grid and down on a conveyor belt nine feet below. But the heat is so intense it even blistered and scorched rubber belts that were supposed to have been specially designed for hot-material service. Belts were only lasting 3 or 4 months.

When a B.F.Goodrich man heard of the problem, he recommended a new conveyor belt called Solarflex. This B.F.Goodrich belt is made of a special rubber that stays soft and pliable at temperatures that cause other belts to harden, crack and finally break down.

Since 1954, B.F.Goodrich Solarflex belts have been used exclusively on this job. Because of their greater resistance to heat, they last from six to nine months—a 50% increase in belt life.

In this plant, the maintenance supervisor had a good rule which hundreds of others like him follow. Instead of accepting the high cost of frequent replacements, he called in a B.F.Goodrich representative and found exactly what he needed to cut costs and keep the foundry running with fewer shutdowns and delays.

Your B.F.Goodrich distributor has exact specifications for the B.F.Goodrich belt described here. And, as a factory-trained specialist in rubber products, he can answer your questions about the many rubber products B.F.Goodrich makes for industry. *B.F.Goodrich Industrial Products Co., Dept. M-777, Akron 18, Ohio.*

B.F.Goodrich ***industrial rubber products***

AEROPARTS MANUFACTURING COMPANY'S RECIPE FOR SUCCESS

Take on the Tough jobs put them on a Warner & Swasey

R. E. Radford started his company in Tulsa, Oklahoma, in 1943 with a $350.00 investment. Today, his new 40-man plant does sub-contracting on a national scale with a reputation for price and quality.

But, success was not immediate. Even as late as 1952, business prospects looked dim. Then, a man's resourcefulness plus a new kind of machine teamed up to start a literal chain reaction of success. Here's how it happened.

Radford had the idea that there was a profitable future in taking on the tough jobs that were not desirable to other companies. He also had faith to back his convictions. Now all he needed was the right machine to do the job . . . his search was a short one . . . the new Warner & Swasey 1 AC looked like the machine.

This new single spindle chucker allowed him to expand from his former policy of making screw machine parts to one involving larger, more complicated work . . . permitted him to run short cycle jobs at close tolerances of .001" and less . . . hold micro-inch finishes down to 20 RMS . . . make full use of the machine's late cross slide, flexible tooling characteristics. The dependability of this machine impressed him as much as did its productivity.

These advantages, and others that soon reflected themselves in increased values rendered to his customers, brought more business. So another Warner & Swasey 1 AC was installed in 1954 and a third in 1955.

Today, men and management at Aeroparts maintain their high regard for their Warner & Swaseys. And in "Tex" Radford's words, "These machines were integral in the growth of this company!"

YOU CAN PRODUCE IT BETTER, FASTER, FOR LESS

...WITH A WARNER & SWASEY

WARNER & SWASEY
Cleveland
PRECISION MACHINERY SINCE 1880

The Big Squeeze: Or What Would You Do?

The steel settlement was forced on the industry. It is poison for some steel companies and it is going to be sad news for other firms and industries.

What about the smaller steel firm which has higher costs, older employees, less product mix, remoteness from markets and obsolete equipment? The textbook and the classical guys say, "Toss the firm overboard." It can't stand on its own feet, they say.

What about the iron ore companies which are struggling with high cost mines, underground mines, mines soon to run out, high labor costs, and old equipment? The smart fellows say new developments will replace these older companies.

What about the manufacturing firms which will be handed the steel settlement for signature? They will sign eventually, so why not now? Steel did, why not us, they ask.

Or take other industries which had hoped steel would be able to turn the tide—a very big order that wasn't in the wood. They must sign contracts they had hoped to dodge.

Must all these cases be settled by bankruptcy, net losses or liquidation? Shall we argue that firms which can't come up with more money, costly equipment and new market potentials should be dumped by the wayside?

If smaller firms go out of the picture because of high wage, material, and equipment costs, and because of inefficient operations—compared to bigger units—what will happen? The Government moves in and cries monopoly. It then begins to control and dictate. Soon the firms which fought a good fight to try to keep wage costs down are accused of forcing smaller firms out of business.

In steel, all of this stems from the industry-wide grip of an international union. It wrings a good contract from 11 companies and imposes it on all the rest. To make it worse, the Government helps the deal along.

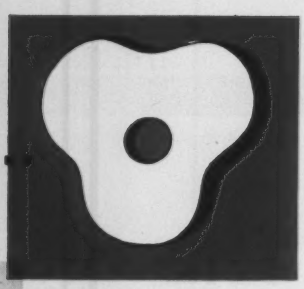
So what would you do in such a frustrated and straitjacketed condition? You would not liquidate. Perhaps you would threaten to. You will probably stick it out like thousands of others will. But no one has the right to ask you to kiss and make up and be a good Joe after you are clobbered.

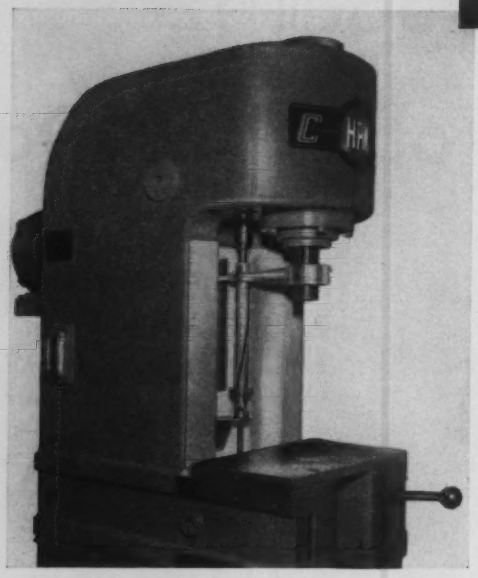
You live in hopes things will change and that some day the union will see that in the long run it is cutting its very own throat.

Tom Campbell

Editor-in-Chief

THIS SIMPLE CAM..



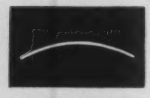


CAN ADAPT THIS LOW-COST PRESS...

INTO A COMPLETELY AUTOMATIC, SYNCHRONIZED PRESS ELEMENT

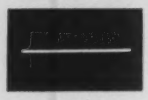
It's true. The miracle of servo-feedback control, with cam operation of the control valve, converts this low-cost manual press into an automatic power package for countless production jobs. The C-Press is basically a manually operated unit. Substitute cam operation in your tooling design, for manual lever, and the ram performs to the contour of the cam. Ram speed, tonnage on work, acceleration or deceleration can be "contour" controlled for the exact motion you require. For example: Installing a container closure or lid, normally calls for a completely automatic production machine. While the can is filled, the closure operation takes place at another station for either crimping or pressure fitting. The C-Press ram, actuated by the contoured cam, provides the exact timing, motion and force to match the requirements of the job.

Fast Cycle



Slow Cycle

Immediate Acceleration



Stop

The demand-response action of the servo-controlled C-Press fits a wide variety of production tasks. In manual operations like straightening, applied force can be carefully applied to gauge readings with the motion of the ram following exactly the hand lever movement. You can apply 5, 10 or 15-tons force on work as easily as bending a cigarette in your fingers.

Find out, today, how the servo controlled, H-P-M C-Press can be put to work for your production needs with savings in time and capital outlay. C-Press is available in manual and automatic models, with index table production accessories for many different needs. Write for complete information.

THE HYDRAULIC PRESS MANUFACTURING COMPANY
A Division of Koehring Company, Mount Gilead, Ohio, U.S.A.

HPM

H17

Predict Metal Cracks

Hot cracking of stainless steel and other alloys is a serious metallurgical problem. A Westinghouse research scientist has devised a simple test to discover and predict hot cracking. Test samples less than an ounce in weight forecast this behavior susceptibility in metal structures weighing many tons.

Symbols Represent Parts

A system of shorthand symbols represent machine parts to reduce the cost of producing 3-dimensional exploded views. One man can sketch all parts of a complicated machine, with thousands of parts, in a single day. His shorthand notes can be translated into the 3-dimensional line drawings later.

Stronger Honeycomb Cores

The 5056 aluminum honeycomb, produced by Hexcel Products, Inc., is reported to be the strongest aluminum honeycomb ever made. Preliminary data indicate the new material is 15-30 pct stronger than any comparable product on today's market. This honeycomb will be available in cell diameters from ⅛ to ⅜ in. Foil gages will be 0.001 and 0.002 in.

Improves Heat Resistance

Alloying of columbium with titanium, tungsten and vanadium provides the key to improved oxidation resistance at high temperatures. Another new alloy of columbium, tungsten and zirconium shows a higher strength to weight ratio at 2200°F than any other fabricable metal.

New Screw Machine Stock

Preliminary tests, by Aluminum Co. of America, indicate that experimental alloy X6262 has better machinability, corrosion resistance and finishing qualities than screw machine stock alloys 2017 and 2024. Although free machining alloy 2011 offers the best machinability of any aluminum screw machine stock, alloy X6262 is superior to alloy 2011 in both corrosion resistance and finishing qualities.

Reprocess Titanium Scrap

Induction melting of titanium alloy scrap yields castings with mechanical properties almost as good as forged titanium. The process is reported economical. Induction stirring of the melting furnace produces high-strength, ductile metal of uniform temperature and composition. A report for the U. S. Army includes metallurgical evaluation of the reprocessed castings.

Polyethylene Gives Shield

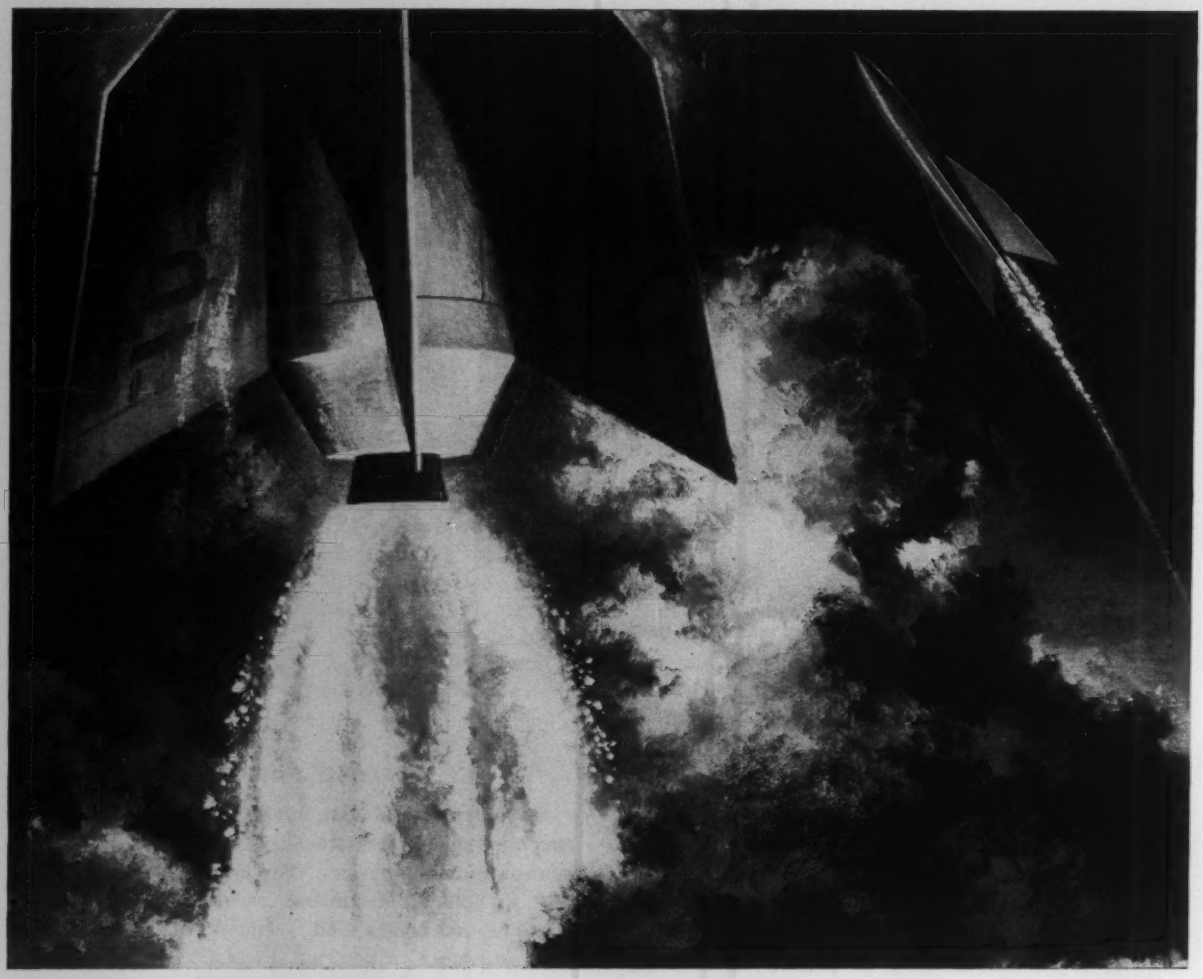
Polyethylene moves up rapidly as a lightweight, effective shield for atomic reactors or other neutron radiating devices. Used with conventional lead shielding, polyethylene provides additional shielding and brings total weight down. It shows good resistance to neutron attenuation and heat.

Depreciation Tax Reforms

President Eisenhower plans to recommend sweeping tax revisions late in 1960. Depreciation reform will be included. The President and leaders in Congress have agreed to skip tax-cuts until after the November elections. This should avoid the temptation to make irresponsible cuts. A year of good business, high revenues and a tidy surplus should clear the way to meaningful relief in 1961.

Provides Memory Devices

Research data on barium titanate and other ferroelectric materials for use as information storage media appear in a recent report for the U.S.A.F. Actual digital and tape storage apparatus, for information storage and other purposes, bear out the usefulness of ferroelectrics. Practical and theoretical work includes development and operation of memory devices for large-scale digital calculators.



SYLVANIA—in the forefront of refractory metals processing

. . . Tungsten and molybdenum ingots up to 10″ diameter, 4 ft. long

. . . Highest purity pellets and powders

Sylvania's latest achievement is the production of refractory metal ingots large enough for direct fabrication into missile and rocket parts. These ingots contain 100% tungsten or molybdenum . . . or they can be supplied as a solid solution alloy of these two elements in many combinations.

Another important Sylvania advance is the in-process machining of these ingots *before* final sintering . . . a distinct cost saving.

However, the smooth as-sintered surface of our standard refractory metal ingots is suitable for many forging and rolling operations.

Pellets and Powders

Sylvania produces highest purity powders and pellets of tungsten and molybdenum and their alloys. Their uniform high quality is the industry standard.

Arc-casting Electrodes

Sylvania's new large-size capabilities offer substantial operating economies for arc-casters. *Electrodes now can be produced in sizes up to 10″ diameter and 4 ft. long.*

• • •

For complete information on these Sylvania refractory metals, write to Sylvania Chemical and Metallurgical Division.

SYLVANIA GENERAL SYSTEM

Subsidiary of

GENERAL TELEPHONE & ELECTRONICS

SYLVANIA ELECTRIC PRODUCTS INC.
Chemical & Metallurgical Div.
Towanda, Penna.

Color TV

Sir—I read with interest "Color TV sales: In the Black?" by K. W. Bennett in the Dec. 10, 1959 issue of IRON AGE and was very much surprised to find that General Electric was listed among the three new entrants into the field of color TV.

The reason for my surprise is that I have been enjoying a G.E. color TV for two years and have been very happy with its performance.

From my own experience of the last two years I can well understand (Don't get me wrong, I love color TV) why TV companies are reluctant to invest millions in production lines for a model that cannot straighten out what it receives over the waves.—R. T. Samuelson, Operating Layout Engr., Wheeling Steel Corp., Wheeling, W. Va.

▪ **When we used the word "new," we meant to refer that they would return to some kind of distribution which would accept color TV as a regular and accepted member of the general product line. In checking out the story, we talked with GE distributors and they weren't sure GE was still producing. We went to GE at Schenectady, N. Y. They confirmed that color TV is not regarded as a current production item.—Ed.**

Steel Study

Sir—Your "15-State Study; Steel Use by Industry" is indeed a remarkable accomplishment. We've been on the look-out for years for a "current" analysis of the "geographic" distribution of demand for galvanized sheet. Now here it is all tied up in a neat little bundle.

Having had occasion to conduct a similar study or two on chemical rather than metallurgical products, we have a pretty good idea of the thought and effort which must go into such an undertaking. Congratulations are definitely in order. We'll look forward to more of the same. —H. Jacobson, Asst. Engr., Metallurgical Dept., Singmaster & Breyer, Inc., New York.

On Inventions

Sir—Your Dec. 24 issue of IRON AGE has only been out two weeks and we have already received a great number of requests from over half the United States for free copies of the booklet entitled "Inventions Wanted By the Armed Forces."

We thank you for mentioning this important booklet in your "Fatigue Cracks" column and we might add the requests are still coming in strong.—E. F. Doidge, Business Analyst, U. S. Dept. of Commerce, Field Services, Phila., Pa.

Fire Pump

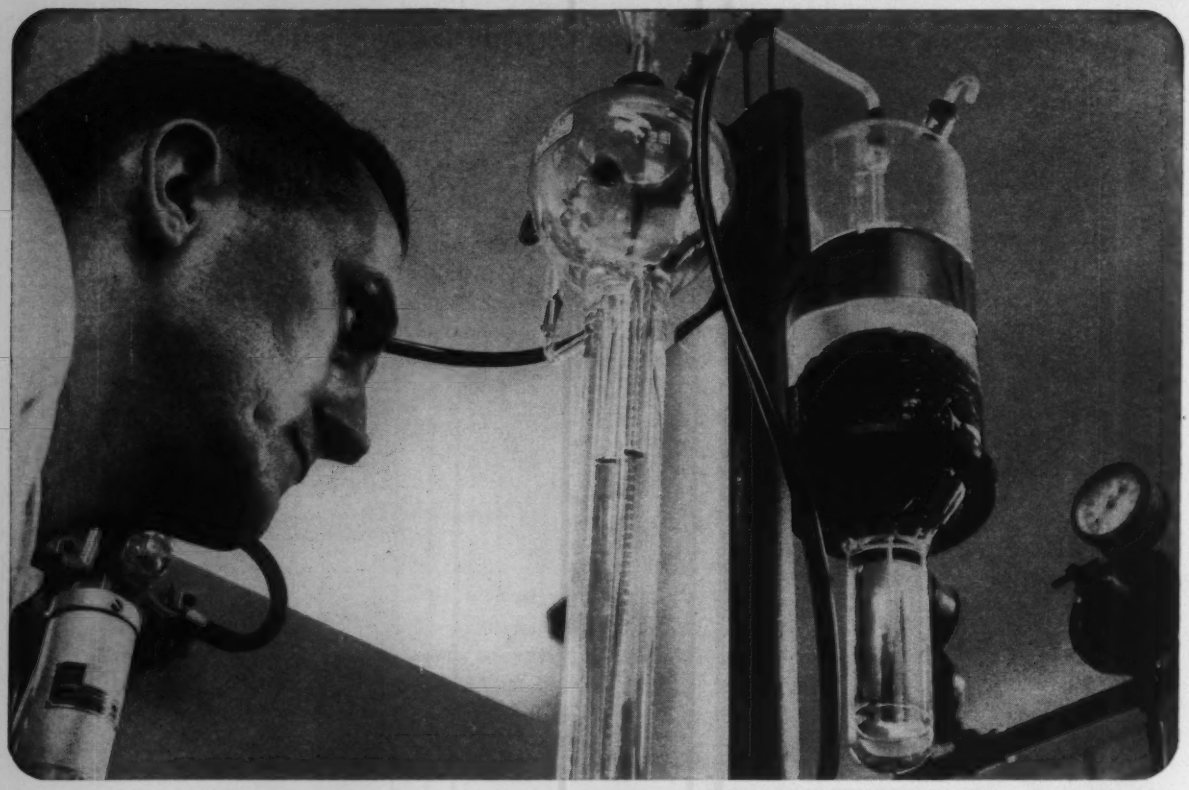
Sir—The Dec. 24 issue of IRON AGE contained an article on pump and compressor output and was illustrated with a new portable gasoline operated portable pump for use in fire fighting.

We would like very much to have the address of the Goodyear Pump Company of New York whose name was given as the manufacturer.—L. O. Wiese, Pres., Wiese Plow Welding Co., Inc., Perry, Iowa.

▪ **Write to Goodyear Pumps, Inc., 9 Rockefeller Plaza, New York 20, N. Y.—Ed.**

SPEED-BAND®
Capewell's new concept in band saw blades is setting new production records
ON ALL KINDS OF JOBS
ON ALL KINDS OF MATERIALS
ON ALL KINDS OF MACHINES
Ask your Capewell Distributor for the complete story.
Available only from Capewell Distributors
CAPEWELL
THE CAPEWELL MFG. CO.
HARTFORD 2, CONN.

***Experience**—the added alloy in **Allegheny Ludlum** tool steels*



QUICK, FAST TESTING for carbon content is done not once or twice but 8 times per melt in A-L's Chem Lab with this direct reading Leco carbon determinator.

Carbon content checked 8 times during melt to guarantee A-L tool steel hardenability

Lab tests for carbon eliminate your guesswork; provide high hardness, uniform hardenability, reproducible tool performance.

Because carbon has the greatest influence on hardenability, Allegheny Ludlum watches it carefully during the melt. Testing a specimen for carbon takes only a few minutes. Therefore, A-L checks for carbon content 8 times during the melt, and makes the necessary adjustments to insure accurate control of carbon. This control means Allegheny Ludlum can hold carbon content to a closer range than most customers specify.

Carbon control at Allegheny Ludlum assures you of precise response to heat treating. This control in the melt brings you predictable, *high hardness*, *uniform hardenability* and *reproducible tool performance*.

This is just one of the many things A-L does to insure high quality. Here are some others: close control over forging techniques, rigid temperature-time programming, careful testing of billets prior to processing to insure good surface and sound interior, control over annealing to give you the right hardness for your exact machining operation, thorough metallurgical testing to insure top tool steel quality and meeting of your specifications.

Allegheny Ludlum stocks a complete line of tool steel sizes and grades. Call your nearest A-L representative; you'll get quick service and counsel on such problems as heat treating, machining, grade selection, etc. Or write for A-L's publication list which gives full data on the more than 125 technical publications offered. They'll make your job easier.

ALLEGHENY LUDLUM STEEL CORPORATION, Oliver Bldg., Pittsburgh 22, Pa. Address Dept. A-25.

WSW-7261

ALLEGHENY LUDLUM

Tool Steel warehouse stocks throughout the country... Check the yellow pages

every grade of tool steel... every help in using it

The Outdoors

Park and picnic areas have the opportunity to take on a better look now that Alcoa has come up with aluminum rest stations and picnic shelters.

The rest stations (below) have been designed for installation in areas where maintenance is a problem. The structures come in "Autumn Brown" and a coarse bark pattern is rolled into the metal to make it blend with surrounding wooded areas.

Lighting — Daylight illumination is permitted by the addition of green plastic under the eaves. They are adaptable to any type plumbing.

The picnic shelters use ribbed aluminum roofing and structural aluminum posts.

Fixed Prefixes

The National Bureau of Standards has added four new prefixes for denoting multiples and sub-multiples of units.

They are designed to save words and space in writing reports, etc. The new entries are: Tera, (one trillion); giga (one billion); mano (one millionth); and pico (one trillionth).

These new additions to the growing list of prefixes bring the total to 12. In their abbreviated forms they read, T, G, M and P.

New Look in Lockers

New luggage lockers, recently installed in New York City's Grand Central Station, have features the ladies will have a hard time passing up, with or without their traveling bags.

Instead of the drab gray color one usually associates with terminal lockers, these are made of bright stainless steel. Some have "mirror" surfaces and others "quilted" exteriors. Those with the shiny surfaces are designed to give the lady traveler a spot where she can give her cosmetics and hairdo a quick check before going out into the street. The others require little cleaning.

Dollars and Scents—Here's another twist: Mercury International, the company that owns and operates the lockers, is now experimenting with deodorizers that will scent the lockers with a "fresh outdoorsy aroma."

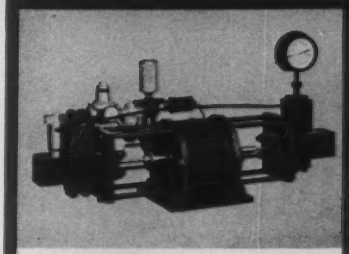
Why are the lockers made to attract the fair sex? They use half of all coin operated lockers in the nation.

W. Richard May, Mercury International's president, says, "We haven't found the right odor yet, but we will try anything short of Chanel No. 5."

Maybe Old Spice would work.

REST STATIONS: Made of aluminum for park and picnic sites.

ALDRICH
AIR-DRIVEN HYDRAULIC PUMPS



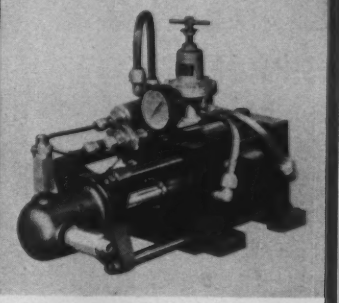
For production service: Heavy duty 6-inch stroke pump, single or double acting.

For production or laboratory . . . handling small volumes of fluid at pressures up to 50,000 psi.

For hydrostatic testing . . . tubing, valves and pressure vessels.

For operating hydraulic presses, cylinders and valve positioners.

Immediate shipment from factory stock.



For intermittent service: 3-inch stroke pump has low first cost, high reliability.

Aldrich air-driven hydraulic pumps operate on normal plant air. They are compact, simple to install, economical to operate. Write today for Data Sheet 36 (6-inch stroke) or Data Sheet 36A (3-inch stroke).

ALDRICH

ALDRICH PUMP COMPANY
8 PINE STREET, ALLENTOWN, PA.

new press capacity

for larger steel sections

CAPACITY	2000 Tons
WORKING PRESSURE	4250 psi
STROKE	48"
DAYLIGHT	108"
COLUMN CENTERS	
(left to right)	90"
(front to back)	52"

serving better production of our first quality tool steels

(and our customers' special forging needs)

2000 tons of new Vanadium-Alloys Steel press capacity is here at work—speeding delivery of more uniform large forgings in our regular production, and ready to meet special custom forging demands. Ingots from 12″ square to 40″ square are regularly worked. Let us quote on your block, disc and special forging requirements in First Quality tool steel grades.

Vanadium-Alloys Steel Company
LATROBE, PENNSYLVANIA

DIVISIONS: Anchor Drawn Steel Co. • Colonial Steel Co. • Metal Forming Corporation • Pittsburgh Tool Steel Wire Co.
SUBSIDIARIES: Vanadium-Alloys Steel Canada Limited • Vanadium-Alloys Steel Societa Italiana Per Azioni • EUROPEAN ASSOCIATES: Societe Commentryenne Des Aciers Fins Vanadium-Alloys (France) • Nazionale Cogne Societa Italiana (Italy)

COMING EXHIBITS

Plant Maintenance & Engineering Show — Jan. 25-28, Convention Hall, Philadelphia. (Clapp & Poliak, Inc., 341 Madison Ave., New York 17.)

Tool Show—April 21-28, Detroit Artillery Armory, Detroit. (American Society of Tool Engineers, 10700 Puritan, Detroit 38.)

Welding Show—April 25-29, Great Western Exhibit Center, Los Angeles. (American Welding Society, Inc., 33 West 39th St., New York 18.)

Southwestern Metal Show — May 9-13, State Fair Park, Automobile Bldg., Dallas, Texas. (American Society for Metals, Metals Park, Novelty, O.)

Design Engineering Show — May 23-26, Coliseum, New York. (Clapp & Poliak, Inc., 341 Madison Ave., New York 17.)

Production Engineering Show—Sept. 6-16, Navy Pier, Chicago. (Clapp & Poliak, Inc., 341 Madison Ave., New York 17.)

Machine Tool Exposition—Sept. 6-16, International Amphitheatre, Chicago. (National Machine Tool Builders Assn., 2139 Wisconsin Ave., Washington 7, D. C.)

Iron & Steel Show—Sept. 27-30, Cleveland Public Auditorium, Cleveland, O. (Association of Iron & Steel Engineers, 1010 Empire Bldg., Pittsburgh 22.)

MEETINGS

JANUARY

Steel Plate Fabricators Assn.—Annual meeting, Jan. 21-22, Roosevelt Hotel, New Orleans, La. Association headquarters, 105 W. Madison St., Chicago.

Truck Trailers Mfrs. Assn.—Annual convention, Jan. 24-27, Hotel del Coronado, Coronado, Calif. Association headquarters, 710 Albee Bldg., Washington, D. C.

Plumbing Brass Institute—Annual meeting, Jan. 25-27, Hollywood Beach Hotel, Hollywood, Fla. Institute headquarters, One Gateway Center, Pittsburgh.

National Assn. of Waste Material Dealers, Inc., The Atlantic Div.—Regional meeting, Jan. 27, Bellevue-Stratford Hotel, Philadelphia, Pa. Association headquarters, 271 Madison Ave., New York 16, N. Y.

Metal Lathe Mfrs. Assn.—Annual meeting, Jan. 27-28, Sheraton-Cleveland, Cleveland. Association headquarters, Engineers Bldg., Cleveland.

Cutting Tool Mfrs. Assn.—Annual meeting, Jan. 28, Harmonic Club, Detroit. Association headquarters, 416 Penobscott Bldg., Detroit.

Assn. of Steel Distributors, Inc.—Convention, Jan. 30 - Feb. 6, El Mirado Hotel, Palm Springs, Calif. Association headquarters, 29 Broadway, New York 6, N. Y.

American Institute of Electrical Engineers—Winter general meeting, Jan. 31-Feb. 5, Hotel Statler, New York. Institute headquarters, 33 W. 39th St., New York 18, N. Y.

FEBRUARY

American Society for Testing Materials—Committee Week, Feb. 1-5, Sherman Hotel, Chicago. Society headquarters, 1916 Race St., Philadelphia 3, Pa.

Alloy Casting Institute—Mid-winter management meeting, Feb. 4-5, Key Biscayne Hotel, Biscayne, Fla. Institute headquarters, 1001 Franklin Ave., Garden City, N. Y.

FOR PROFIT
STANDARDIZE 100% ON SOUTHERN FASTENERS

It's a safe bet this man is enjoying a profitable operation because he uses Southern Screws. Southern fasteners are profit-partners in companies who use them because Southern quality, service and packaging combine to help keep production lines operating at top speed without costly downtime, materials loss, injury, or rejects due to faulty fasteners. Southern are specialists in fasteners—make nothing else!

Standardize on Southern Screws for profit! Send your next fastener order to Southern Screw Company, P. O. Box 1360, Statesville, North Carolina.

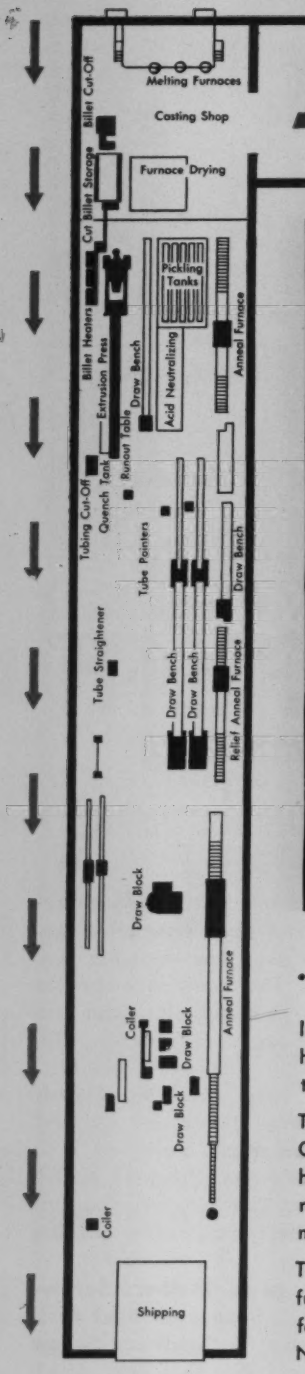
Manufacturing and Main Stock in Statesville, North Carolina

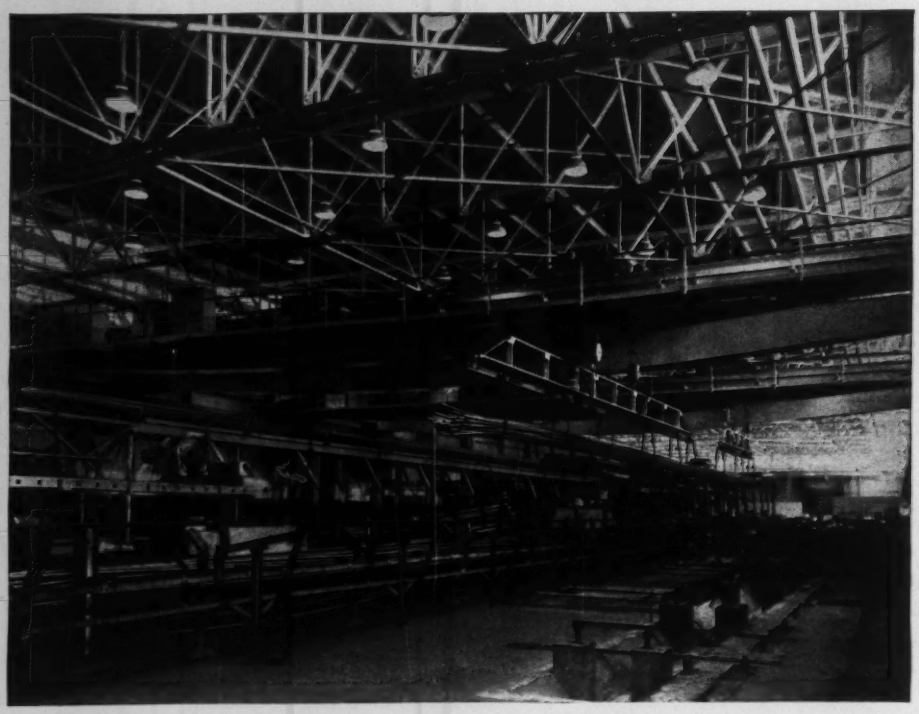
Warehouses:
New York • Chicago • Dallas • Los Angeles

Machine Screws & Nuts • Tapping Screws • Wood Screws • Stove Bolts • Drive Screws • Hanger Bolts • Carriage Bolts • Dowel Screws

Southern SCREW COMPANY
STATESVILLE • NORTH CAROLINA

Northern Cranes





. . . preferred in a large tube mill

In a recently built tube mill all production operations are planned around the most effective handling possible of materials and work. The two overhead cranes shown above are essential to maintain production in this plant; it cannot function without them!

The plant planning staff, after comprehensive study and investigation, decided that Northern Cranes—as evidenced in many other strategic, similar installations—provided the substantial, highest quality engineering design and construction necessary for fast, dependable, uninterrupted two- and three-shift operation six days every week with equally essential production maintenance duty over week-ends.

These 100-foot span Northern Cranes were installed to serve all needs ranging from annealing furnaces, draw benches, tube straighteners and coilers to shipping. Loads ranging up to 157 feet long are handled by the two cranes operating together. This is convincing proof that Northern overhead cranes can be fully integrated as an essential part of processing operations.

Our booklet SE-108-F gives details of their many outstanding features. Let us send it to your planning and layout executives.

Invest in Northern Cranes for highest quality service in overhead handling.

MATERIALS HANDLING EQUIPMENT

NORTHERN ENGINEERING WORKS

210 Chene Street • Detroit 7, Michigan

SE-2031

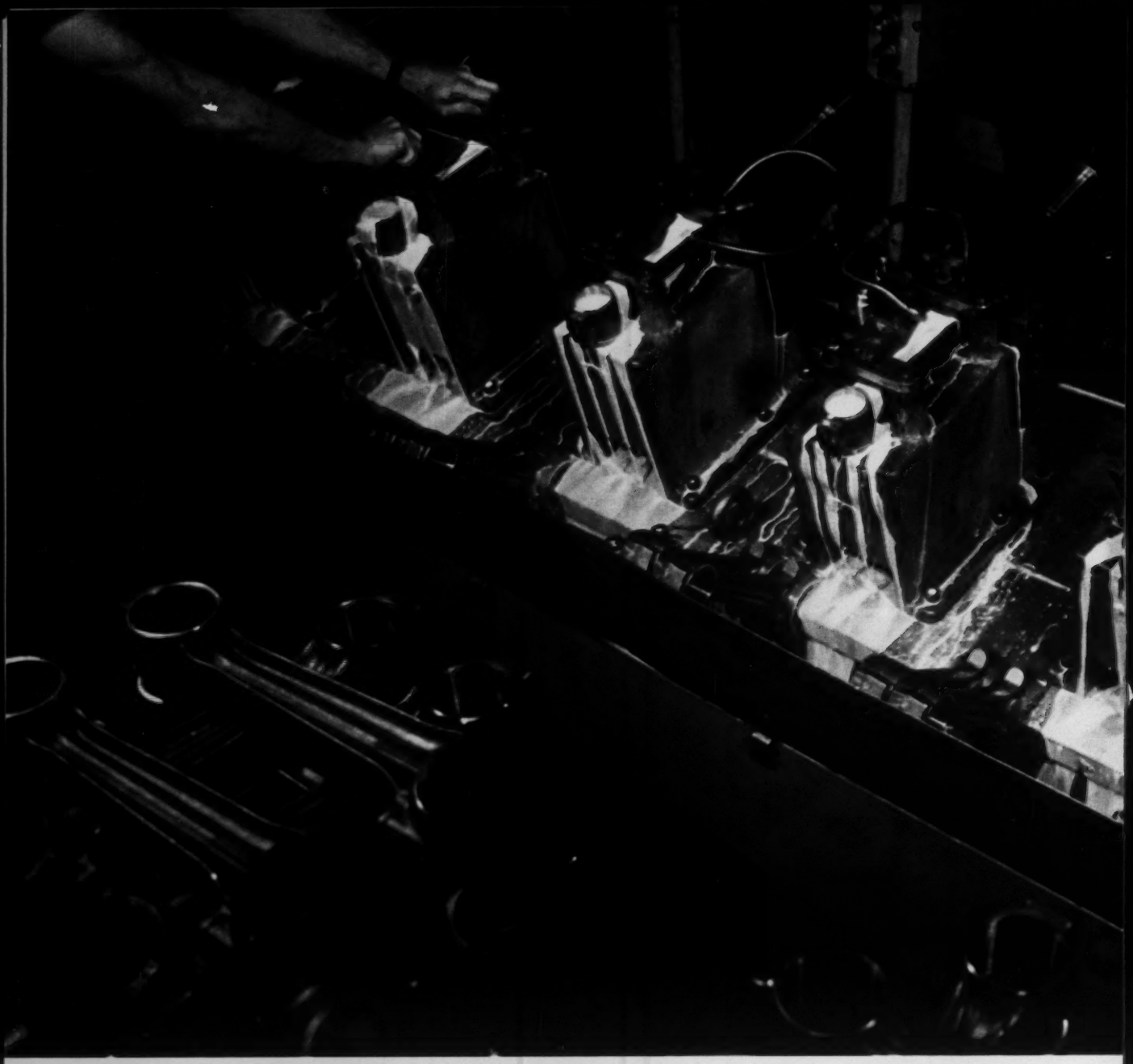
NEXT PHASE . . . *Ansco*

After the white hot metal has cooled, perfection becomes a job for the industrial X-ray technician. Trust this next phase to Ansco. Ansco X-ray films' superb gradation and outstanding uniformity insure quick, positive readings.

Here are four fine Ansco emulsions to suit your every need: Ansco Superay 'A', medium speed, high definition for general purposes. Superay 'B', ultra-fine grain, medium speed emulsion for maximum detectability. Superay 'C', high speed, medium grain where short exposures are called for. Superay 'D', medium fine grain and extremely high-speed performance when used with calcium tungstate screens. Ansco, Binghamton, N.Y., A Division of General Aniline & Film Corporation.

Ansco

Industrial X-ray



Cummins Engine Company does efficient machining, and

GULF MAKES THINGS

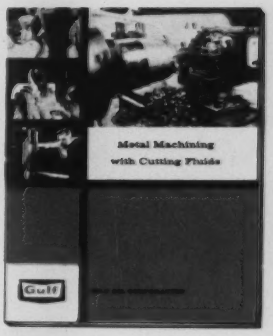
Leave it to the makers of world-famed Cummins Diesel engines to make every possible use of a good product! Cummins uses Gulfcut Soluble Oil not only to obtain superior cutting and longer tool life, but also to get the benefit of its rustproofing properties.

Cummins Foreman James L. Hoppus tells of drilling 12″ deep, ¼″ diameter holes through steel connecting rods. Gulfcut Soluble Oil keeps tool and work so cool, the drilling area so clean of chips, that this tough drilling job is often done in one pass without drill retraction.

For protection against rust, Cummins uses Gulfcut Soluble in two major applications. Sensitive fuel injector parts acquire a rust preventive film when dipped in the heated emulsion. And,

John Hedges, right, Supervisor of Tool Control, Cummins Engine Company, points out fuel injector protected by Gulfcut Soluble Oil to M. S. Ringo, Gulf Sales Engineer.

NEW 116-PAGE MANUAL tells all about cutting oil selection and usage. Send for your free copy of "Metal Machining with Cutting Fluids."



Six-station Avey Drill Press deep-drilling connecting rods with Gulfcut Soluble Oil at Cummins Engine Company, Inc., Columbus, Indiana.

effective rustproofing with Gulfcut® Soluble Oil . . .

RUN BETTER!

come summertime, Cummins adds five gallons of emulsion to the cooling systems of their engines to rustproof them until the winter season.

For every machining operation there is a Gulfcut oil to meet your requirements. A Gulf Sales Engineer can advise you on the proper type to help you improve machining performance. Just call the nearest Gulf office.

GULF

GULF OIL CORPORATION
Dept. DM, Gulf Bldg., Pittsburgh 30, Pa.

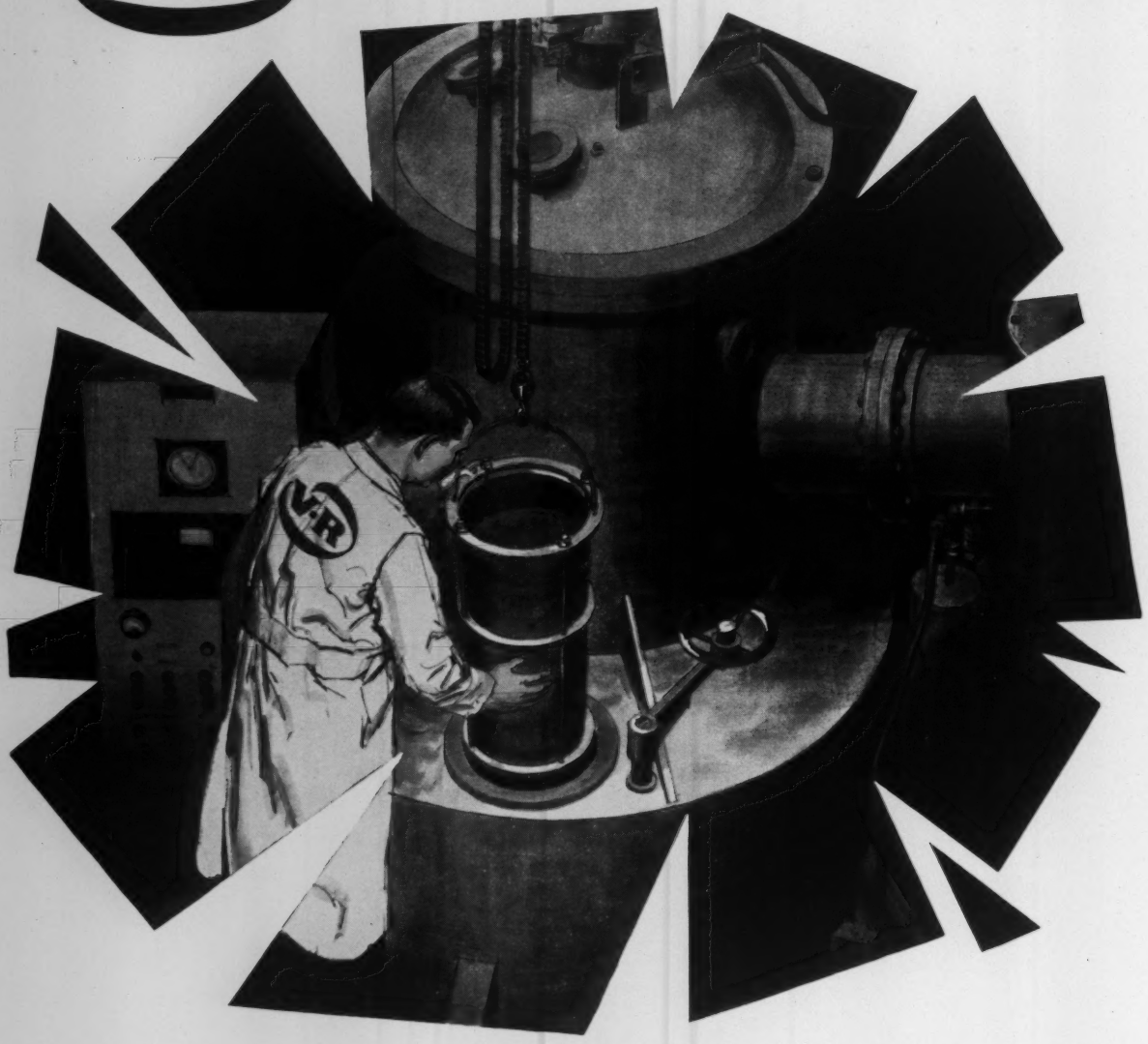
☐ Send literature on Gulfcut oils.
☐ Send copy of "Metal Machining with Cutting Fluids."

Name_____
Title_____
Company_____
Address_____
City_____ Zone____ State_____

SP-9728

V-R

CREATING THE METALS THAT SHAPE THE FUTURE



V-R vacuum sintering makes better carbide

Vacuum sintered steel cutting carbide grades are more versatile because precise control during vacuum sintering removes trace impurities . . . increasing the strength of V-R carbides and their ability to withstand cutting conditions which generate extreme heat. Vacuum sintering is one of the many reasons for the superior performance of V-R's new carbide grades for machining all types of steel and the new superalloys. At V-R, the finest in modern equipment is effectively combined with the metallurgical knowledge gained through 30 years of carbide research and manufacturing experience . . . experience that means better carbide for every use.

V-R **VASCOLOY-RAMET**

810 MARKET STREET • WAUKEGAN, ILLINOIS

C-768

12 B&W IFB lined single stack annealing covers in use in the strip annealing department of Weirton Steel Company, a division of National Steel Corporation, at Weirton, West Virginia.

uses lightweight B&W Insulating Firebrick for single stack annealing covers.

These 12 covers, lined with B&W K-20 Insulating Firebrick, have been in service more than two years in the annealing of low and high carbon strip from Weirton's 54″ strip mill. Identical in construction, the covers are over 17 feet from base to skew and over 10 feet in diameter. The domes are of 9″ K-20 IFB construction.

The K-20 is one of B&W's *lightweight* Insulating Firebrick. In fact, B&W K-20 IFB are at least a third of a pound lighter than other 2000 F insulating firebrick. This means savings in the overall weight of portable covers. Additional savings in fuel consumption and cycle time are possible because lightweight B&W IFB store and conduct less heat. Heat is kept in the furnace, not in the lining.

This application points out advantages of light weight in insulating firebrick constructions. And B&W makes the *lightest* weight insulating firebrick. Consult your B&W Refractories Representative for information on how you can profit with lightweight B&W IFB.

Bulletin R-2-H available on request.

B&W

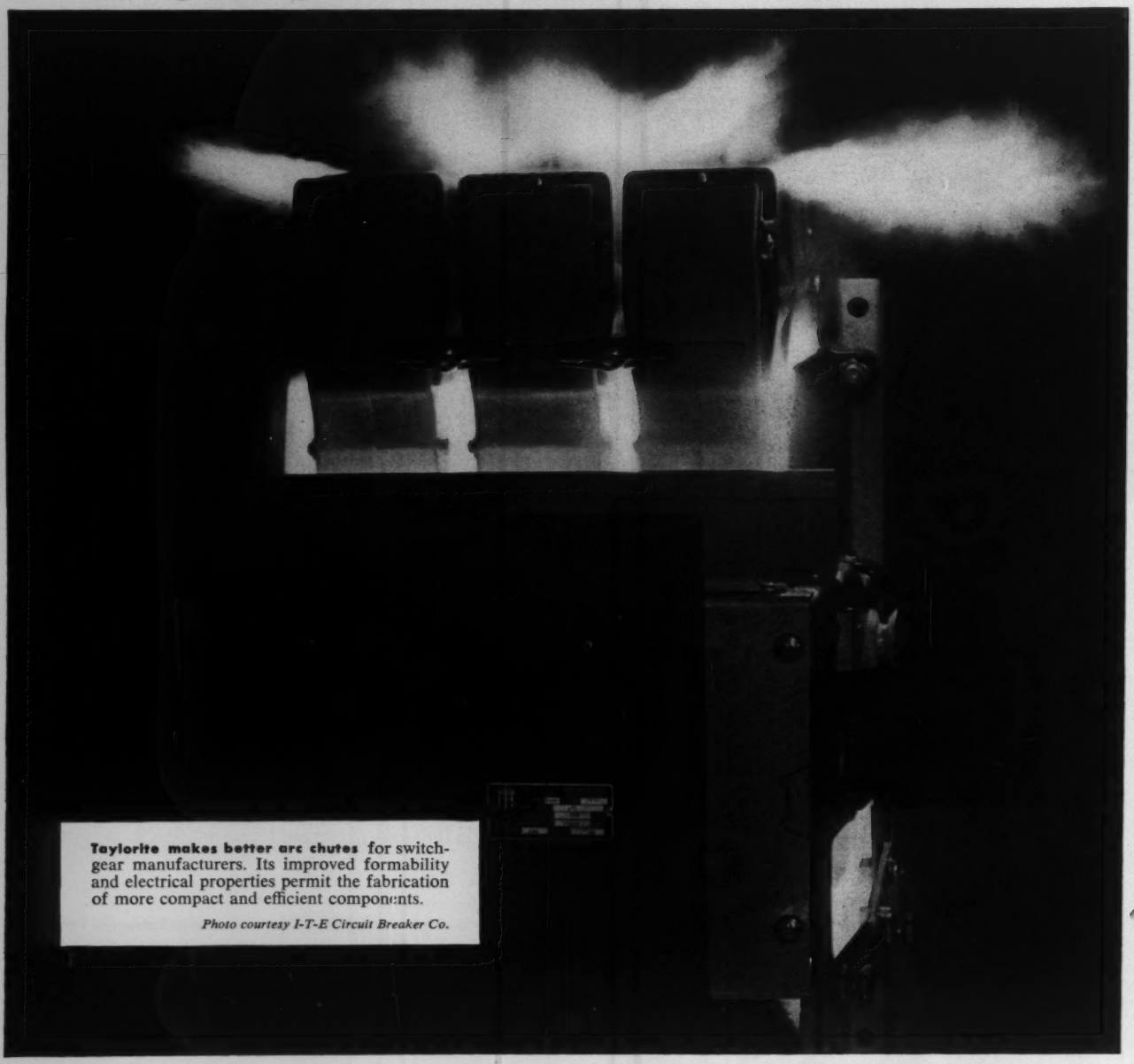
THE BABCOCK & WILCOX COMPANY

REFRACTORIES DIVISION

R-617

B&W Firebrick, Insulating Firebrick, and Refractory Castables, Plastics, Ramming Mixes, Mortars, and Ceramic Fiber.

"TAYLORITE"®--THE NEW NAME FOR IMPROVED VULCANIZED FIBRE



Taylorite makes better arc chutes for switchgear manufacturers. Its improved formability and electrical properties permit the fabrication of more compact and efficient components.

Photo courtesy I-T-E Circuit Breaker Co.

Our vulcanized fibre is so improved that we have given it a new name. Better electrical, physical and mechanical properties, and greater uniformity from lot to lot have made this workhorse material even more adaptable to a broad range of applications throughout industry.

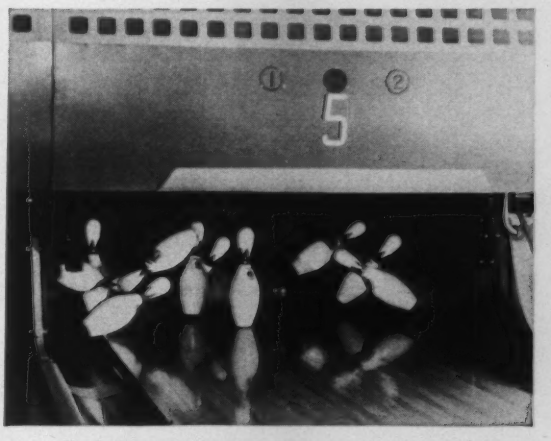
New Taylorite commercial grade, for example, has greater tensile strength, greater flexural strength, greater compressive strength, and greater dielectric strength than the older commercial grade. It is extensively used in the electrical industry. Its high impact resistance, good formability, toughness, and ability to be deep drawn make it an ideal material for 1001 industrial applications. Samples are available. Test them for yourself. Put them under tension, flex them, compress them, form them. You will find Taylorite passes your severest tests with flying colors. And remember, Taylor offers you complete design and engineering assistance.

Data Sheet 2-0 gives complete technical information—write for a copy and for samples today. Taylor Fibre Co., Norristown 52, Pa.

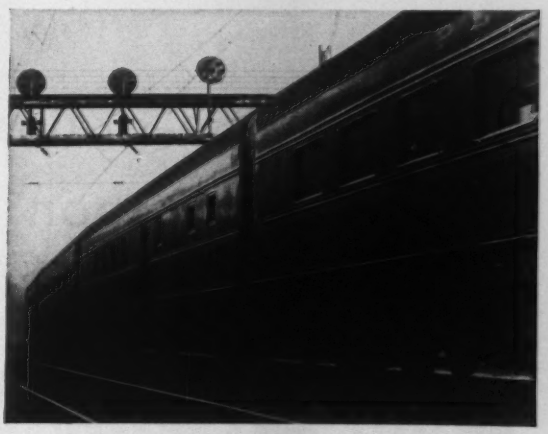
Taylor

LAMINATED PLASTICS VULCANIZED FIBRE

Taylorite offers new flexibility, ply adhesion, tear resistance, resilience and toughness to manufacturers of abrasive discs and drum sanders. Also uniform abrasive distribution.



Taylorite provides new impact resistance and toughness in many structural and mechanical applications. Typical of these is its use as kick back plates in bowling alleys.



Taylorite's improved electrical properties, impact resistance and high uniformity from lot to lot make it ideal for such vital applications as railroad track and switch insulating parts.

Columbium

makes possible

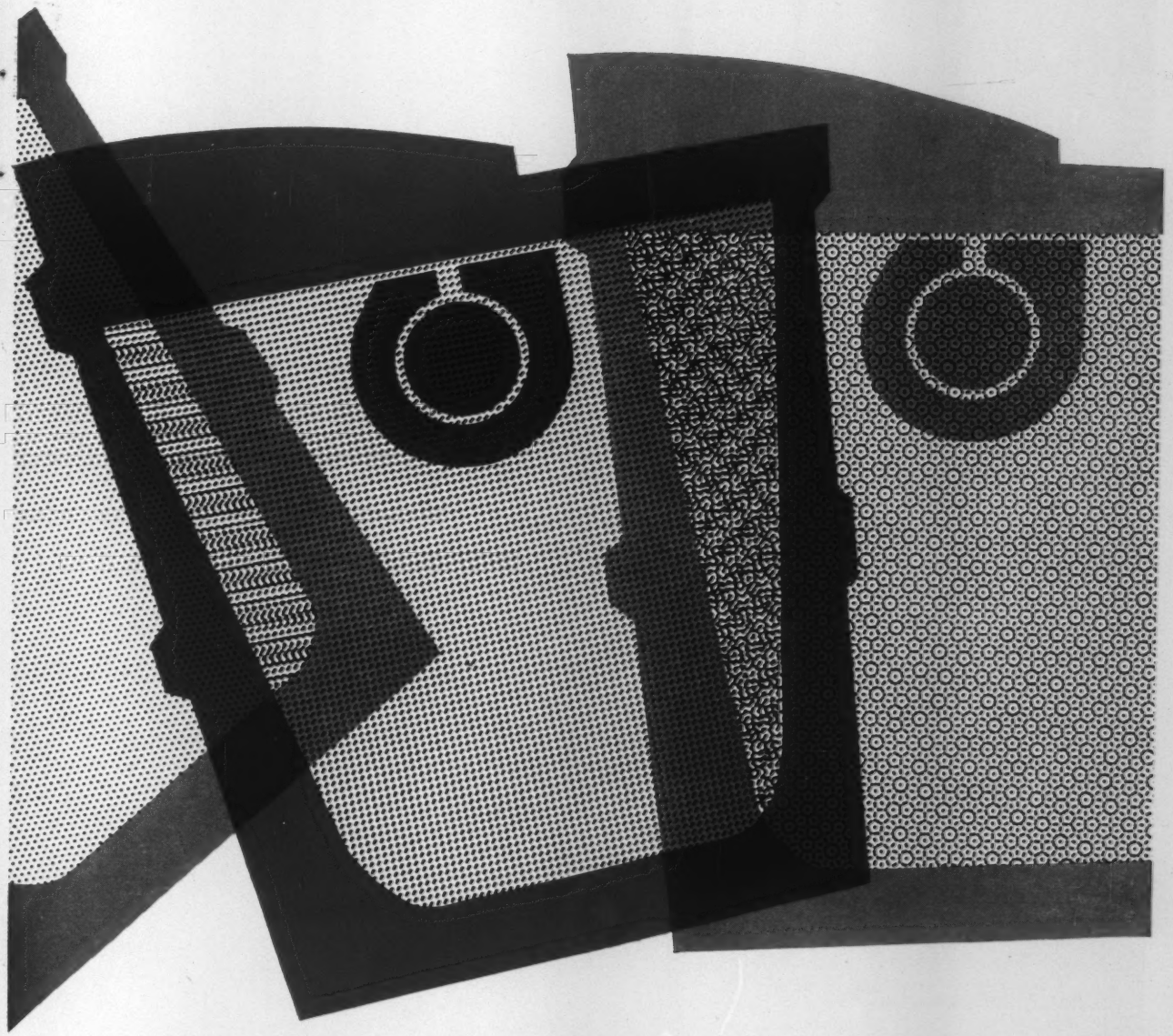
this unique

new

fine-grained

carbon steel

GLX-W



Compare fine-grained GLX-W with the steel you use

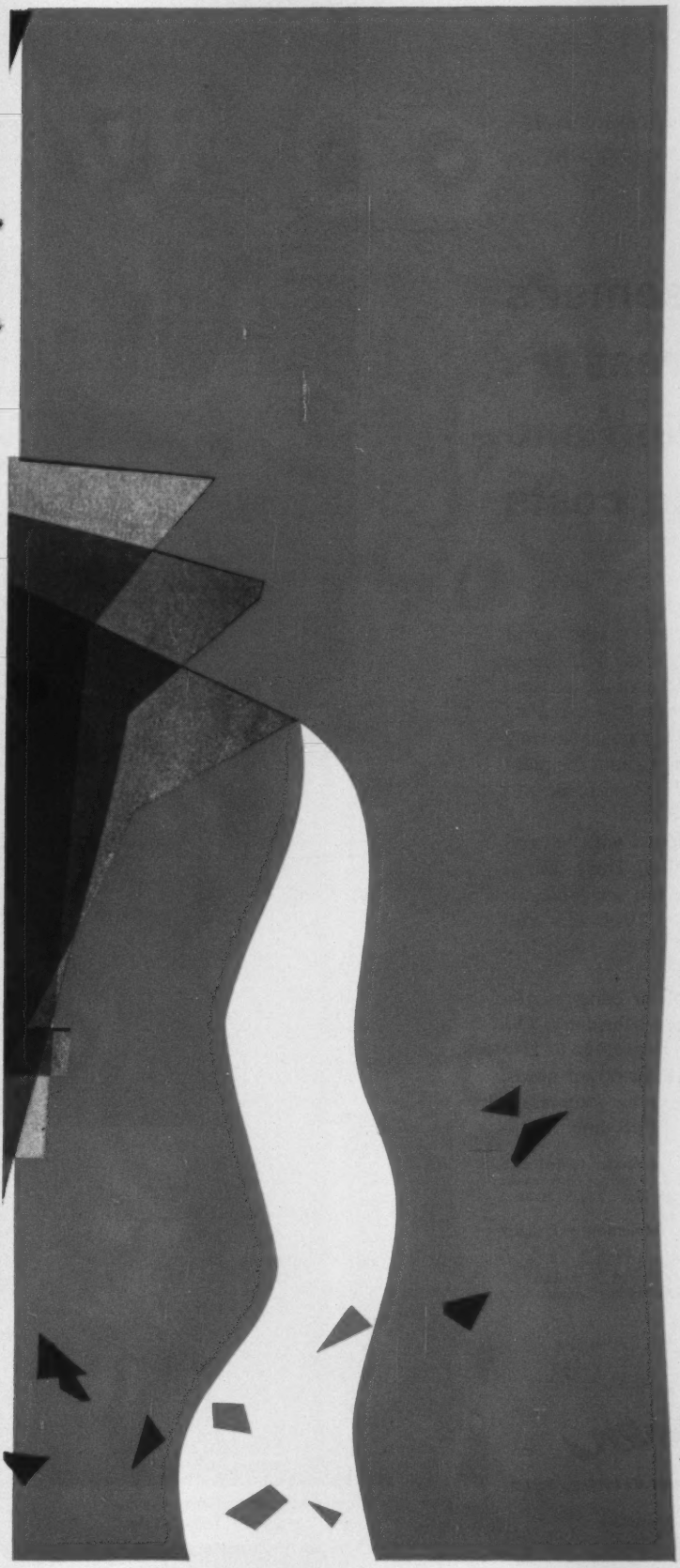
Great Lakes adds a precise amount of columbium to good-quality carbon steel. The result is fine-grained GLX-W steel. Here's how GLX-W compares with mild carbon steels . . .

- GLX-W is 50-100% stronger
- Has greater notch toughness
- Has excellent weldability
- Is as ductile as other carbon steels
- Permits designers to reduce weight up to 35%.

For proof on how GLX-W can cut your production costs, write, wire or phone Great Lakes Steel Corporation, Product Development Division, Department BW.

GLX W **GREAT LAKES STEEL**
Detroit 29, Michigan

Great Lakes Steel is a Division of **NATIONAL STEEL CORPORATION**



NEW STEEL PRODUCTION RECORDS WITH KAISER BASIC REFRACTORIES!

KEY TO SIDEWALLS: ". . . Periclase Chrome metal cased keys in upper sidewalls of electric furnace gave best performance we've had—15 per cent better than any brick used in the past."

BREAKS PRODUCTION RECORD: "... last furnace rammed with Permanente 165 broke its old production record by more than enough to pay for the bottom."

GUNNING FOR PROFIT: ". . . consumption of K/R 165 Gunning Grains is down to 4.5 pounds per ton compared to 6 pounds for competitive mix—makes it a paying proposition."

EACH of these statements from Kaiser Refractories customers reports a new performance record or production record made possible by changing to a Kaiser Refractories Product.

WHY THIS UNIFORM SUPERIORITY? Kaiser Refractories are especially designed for peak performance in specific applications in open hearth and electric steel furnaces. Each is a specially-developed composition, and all are backed by more than 17 years of continuous research and development.

The uniform composition of Kaiser Refractories—your guarantee of dependability—is assured by Kaiser Refractories' fully-integrated facilities. Quality is rigidly controlled from raw material production to assistance in final installation at your mill.

Ask to see the 30-minute color movie, "Progress in Modern Basic Refractories." Arrangements will be made by your Kaiser Refractories Sales Representative.

KAISER REFRACTORIES*

Mexico Refractories Company now merged with Kaiser Refractories

Call or write Kaiser Refractories & Chemicals Division, Dept. S0112, Kaiser Aluminum & Chemical Sales, Inc., at any of the Division Offices listed below:

PITTSBURGH 22, PA. . . . . 3 Gateway Center
MEXICO, MISSOURI . . . . . Mex-R-Co Building
OAKLAND 12, CALIF. . . . . 300 Lakeside Drive

MEX-R-CO High Alumina, Fireclay and Silica Refractories

Kaiser Periclase Brick, Mortars, Grains and Ramming Mixes

*TRADEMARK KAISER ALUMINUM & CHEMICAL CORP.

Dann Goodson, *Manager Motor-Driven Compressor Sales, The Cooper-Bessemer Corporation, explains...*

How Cooper-Bessemer's new, compact Air Compressors simplify installation and reduce costs

The DMR compressors shown here are two models of a new line of *compact, 720 rpm* machines, unmatched in reliability. With these units, Cooper-Bessemer introduces a new standard of installation economy. So highly compact, the DMR compressors are readily installed in existing space, avoiding the need for additional housing facilities. They can be located at strategic points throughout the plant to supplement existing air line services without additional feeders to help supply your production needs at minimum cost.

The new DMR units come completely equipped with integral motor-drive and intercooler... ready for operation. Their control can also be integrally mounted as shown. They are available for two-stage applications in the range of 500 to 2000 cfm and discharge pressures of 80 to 125 psi... also for single-stage and three-stage operation.

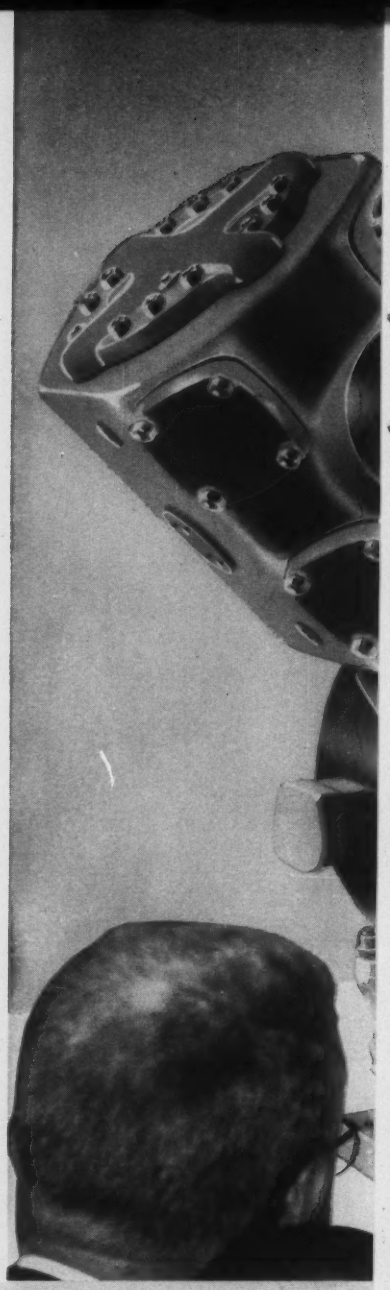
The introduction of this new line of air compressors, plus the portable tool facilities of our new subsidiary, The Rotor Tool Company, enable Cooper-Bessemer to give you full-scope service for your industrial air power needs. Call the nearby Cooper-Bessemer office or air compressor agent for Bulletin No. 94 on the new DMR line.

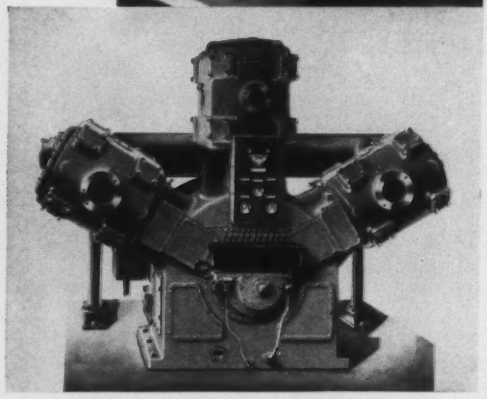
BRANCH OFFICES: Grove City • New York • Washington • Gloucester • Pittsburgh
Chicago • Minneapolis • St. Louis • Kansas City • Tulsa • New Orleans • Shreveport
Houston • Greggton • Dallas • Odessa • Pampa • Casper • Seattle • San Francisco
Los Angeles
SUBSIDIARIES: Cooper-Bessemer of Canada, Ltd. . . . Edmonton • Calgary
Toronto • Halifax
C-B Southern, Inc. . . . Houston
Cooper-Bessemer International Corporation . . . New York • Caracas • Anaco
Cooper-Bessemer, S.A. . . . Chur, Switzerland • The Hague, Netherlands • Mexico City
The Rotor Tool Company . . . Cleveland

Cooper Bessemer

GENERAL OFFICES: MOUNT VERNON, OHIO

ENGINES: GAS • DIESEL • GAS-DIESEL
COMPRESSORS: RECIPROCATING AND CENTRIFUGAL,
ENGINE, TURBINE OR MOTOR DRIVEN





New DMR-3 two-stage air compressor with integral control. Ratings of 300-350 hp.

NEW
COOPER-BESSEMER
DMR-2 TWO-STAGE
AIR COMPRESSOR
WITH
EN-TRONIC CONTRO
100 TO 250 HP

METAL LUMBER

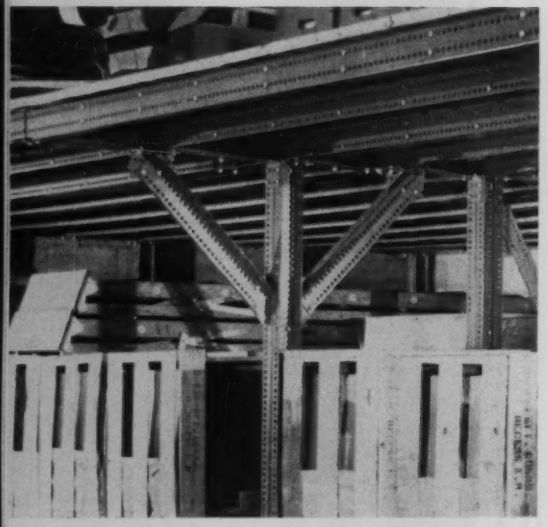
. . . Faster, Stronger, Safer Framing

Republic METAL LUMBER® solves framing problems fast. Simply measure, cut, assemble with ordinary bolt and nut fasteners.

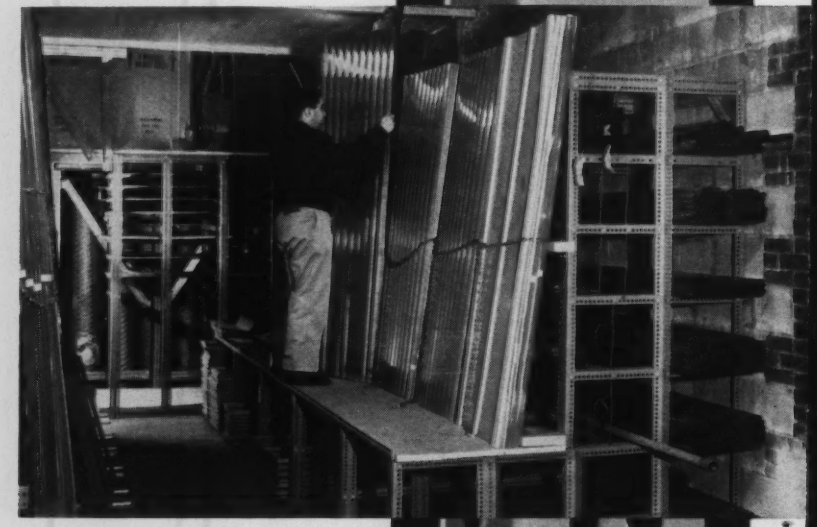
Bolting pattern is a symmetrical series of transverse and longitudinal slots, punched on ¾" centers. This pattern provides bearing capacity in joints equal to or greater than that of the angles in the beam section.

METAL LUMBER is fabricated from cold rolled steel to assure uniform physical properties, and high strength-to-gage ratio. And Bonderized after fabrication for complete protection to all exposed surfaces.

Available in two gages, two widths, in standard bundles of either 10- or 12-foot lengths. Order from your Republic-Berger warehouse. Send coupon for more information.



Build any framing structure faster and easier. No skilled labor required. METAL LUMBER won't warp, can't crack, splinter, or rot; is reusable. Mezzanine structure permits maximum storage at Millhurst Mills, Freehold, New Jersey.



METAL LUMBER solves many warehouse storage problems. Here, split-level storage has METAL LUMBER bins engineered for every type of building product. Flooring is laid on top of metal framing on lower level. METAL LUMBER is used throughout the Millhurst Mills Warehouse.

STANDARD REPUBLIC MATERIALS HANDLING UNITS SIMPLIFY CONTAINERIZATION. Save time in stack, store, ship operations, and reduce storage space requirements. Standard Republic Boxes feature heavy-duty stacking brackets and corrugated construction that combine to deliver long, efficient service at low per-year cost. Four-way fork channels simplify handling in restricted space. Republic-Berger materials handling specialists will work with you in solving your problems. Write today.

REPUBLIC STEEL PALLET RACKS, another Republic standard materials handling unit, save space and simplify palletizing and stacking of bulky, uneven, odd-lot, and fragile materials. Tubular steel supports adjust every six inches to handle palletized material of any height. Two-way entry permits loading and unloading from either side. Select single pallets from any level without restacking. Write for specifications and data.

REPUBLIC WEDGE-LOCK® PARTS STORAGE UNITS are easy to load and unload from either side. A rigid, strong long-parts storage unit, because, the heavier the load, the tighter the grip. Wedge-Lock construction features a post that will not bend, a reinforced shelf that does not sag, and a concealed sway-proof joint. Unlimited shelf arrangements. Send coupon for complete details.

REPUBLIC STEEL

World's Widest Range of Standard Steels and Steel Products

REPUBLIC STEEL CORPORATION
DEPT. IA-8634
1441 REPUBLIC BUILDING • CLEVELAND 1, OHIO

Please send additional information on the following:

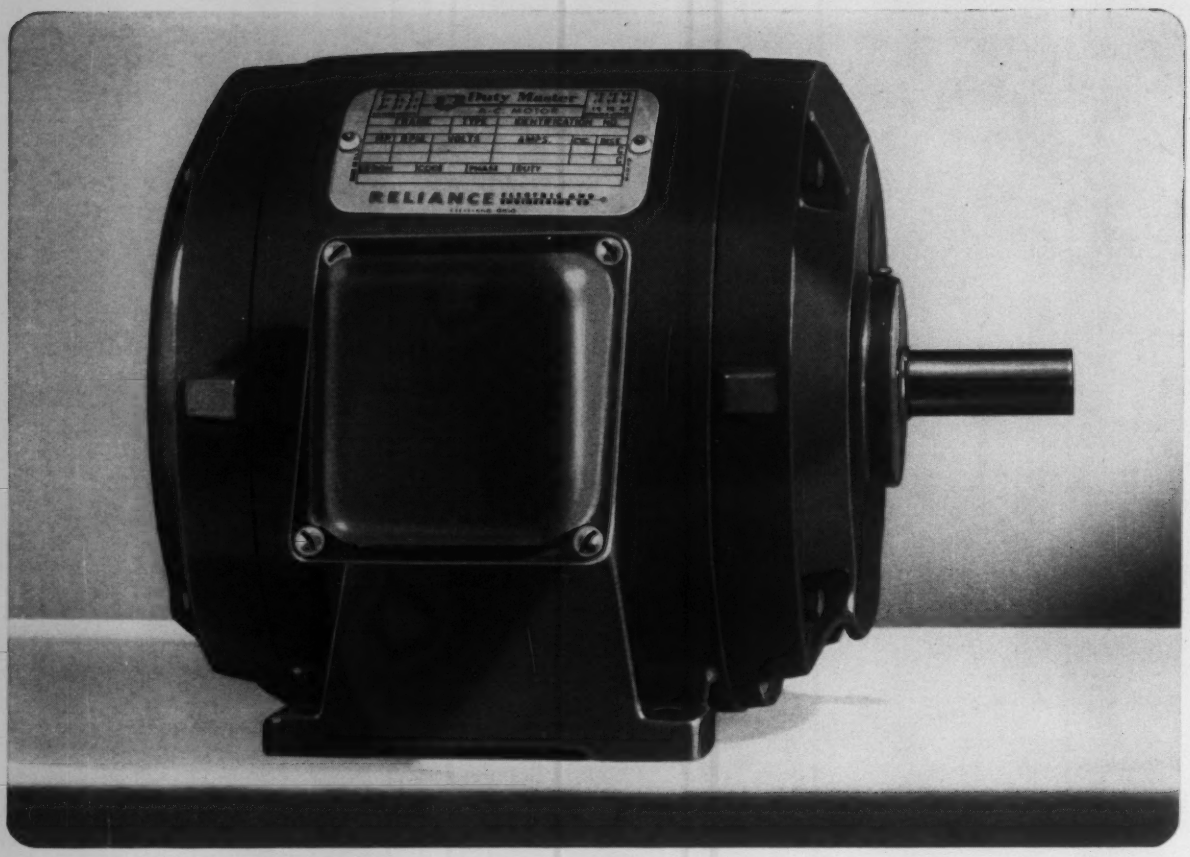
- ☐ Republic METAL LUMBER
- ☐ Materials Handling Equipment
- ☐ Republic Wedge-Lock Shelving
- ☐ Republic Pallet Racks

Name_____ Title_____

Firm_____

Address_____

City_____ Zone____ State_____



Duty Master

a brand new a-c. motor

Product of Reliance Electric and Engineering Company and its Master Electric Division, Duty Master's new design gives users better protection from the inside out, simplified lubrication, better response and improved all around performance. The Duty Master line, from protected-open, to totally-enclosed, explosion-proof, 1 to 250 hp., is ready for delivery *NOW*.

Duty Master's insulation, by means of a series of multiple dips and bakes in thermosetting varnish plus final protection in finishing enamel, makes it resistant to water, acid, dirt and other contaminating elements . . . adds years to motor life.

"Metermatic" lubrication regulates flow of grease to the bearing—provides automatic grease relief. No danger of over-or under-lubrication . . . no maintenance headaches.

Duty Master's low inertia rotor has faster response in starting, stopping and reversing. This plus better ventilation and increased accelerating torques, permits frequent starts and stops without over-heating.

Duty Master's new design proves conclusively that all a-c. motors are *not* alike . . . that this new motor gives users the best value in industry today.

Call your Reliance Sales Engineer or distributor—write for Bulletin No. B-2106. B-1636-A

Product of the combined resources of Reliance Electric and Engineering Company and its Master and Reeves Divisions

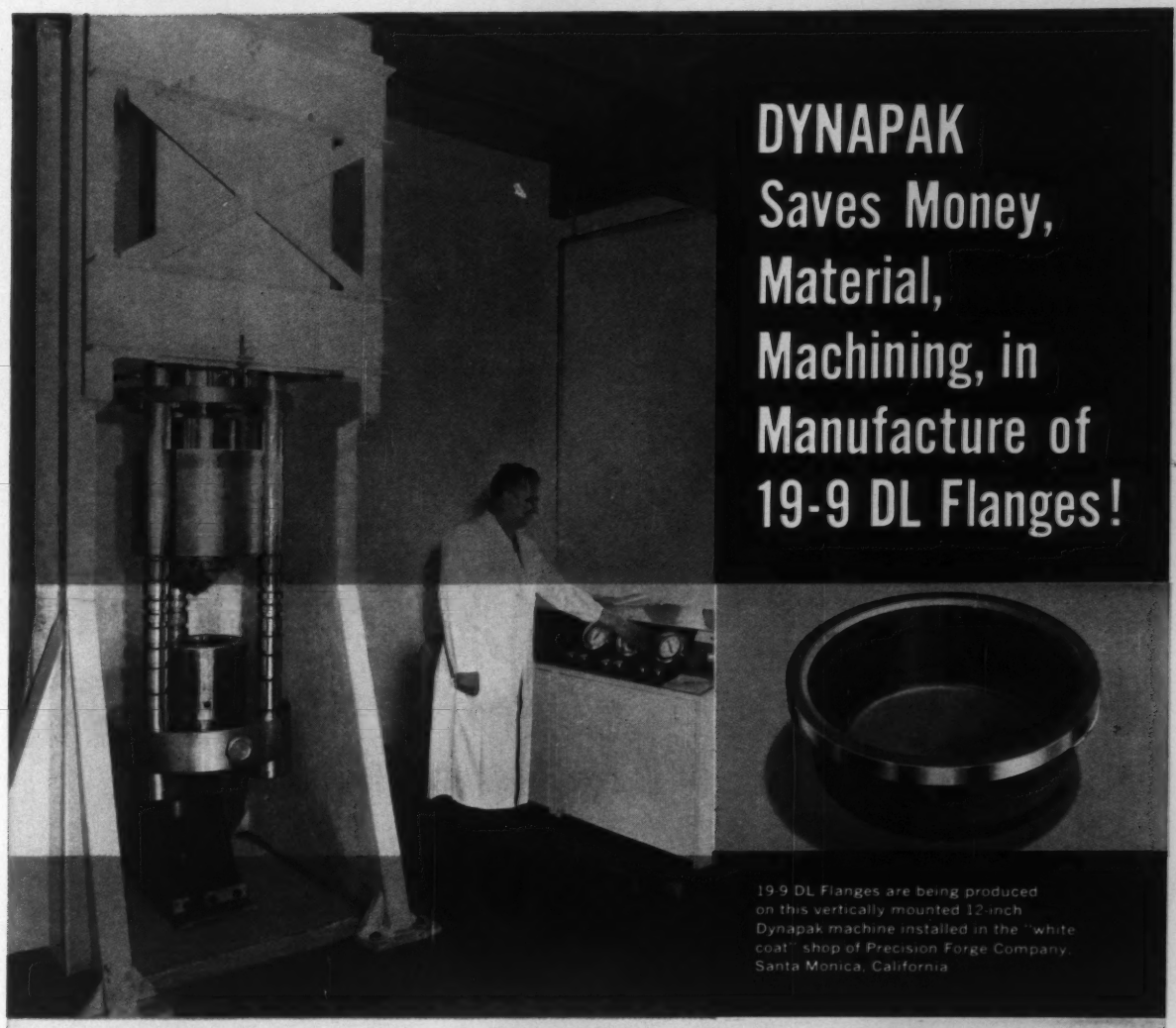
RELIANCE ELECTRIC AND ENGINEERING CO.

DEPT. 21A, CLEVELAND 17, OHIO

Canadian Division: Toronto, Ontario

Sales Offices and Distributors in Principal Cities

Duty Master A-c. Motors, Master Gearmotors, Reeves Drives, V★S Drives, Super 'T' D-c. Motors, Generators, Controls and Engineered Drive Systems.



DYNAPAK Saves Money, Material, Machining, in Manufacture of 19-9 DL Flanges!

19-9 DL Flanges are being produced on this vertically mounted 12-inch Dynapak machine installed in the "white coat" shop of Precision Forge Company, Santa Monica, California

Here are the savings achieved in this Dynapak Application:

- MATERIAL: 60%
- TOOLING: 50% of the cost of conventional forging dies
- MACHINING: Reduced by more than 50% due to forging tolerances of $\frac{1}{32}$ in. and elimination of draft angle.

PLUS

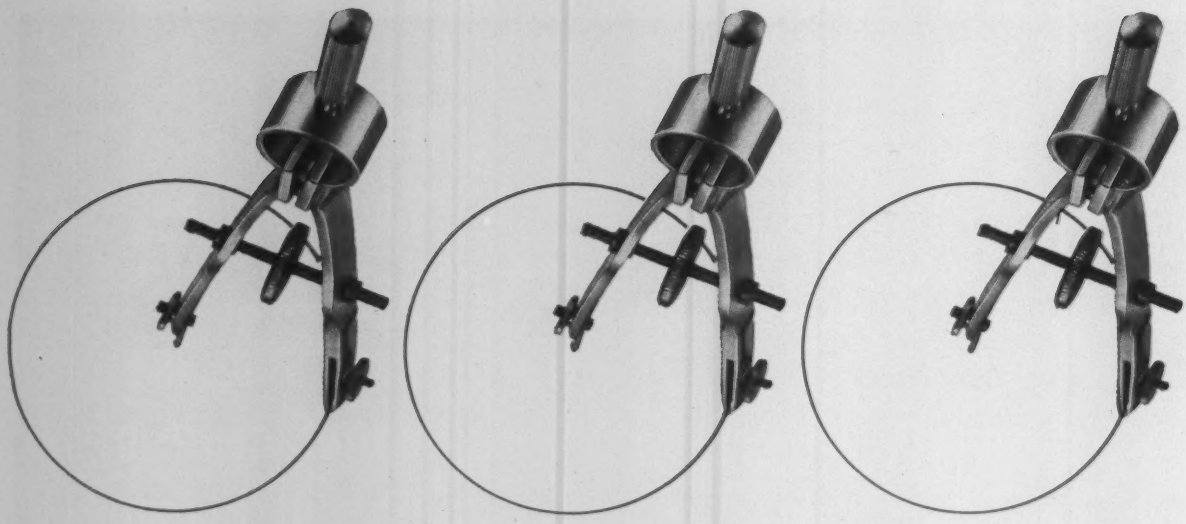
- PRODUCTION RATES: 70-80 per hour
- SUPERIOR PHYSICAL CHARACTERISTICS: Greater strength, uniform and controllable work-hardening, Grain Size No. 11.

Dynapak, industry's first operational high-energy-rate machine tool, offers a breakthrough in metalworking's long-sought goal to produce forgings that can be used with little or no machining. This flange is just one of many forgings now being produced commercially by Dynapak. For complete information regarding application of pneumatically-energized Dynapak in your forging, extrusion, forming, or compaction operations, write, wire, or phone:

DYNAPAK

CONVAIR / A DIVISION OF GENERAL DYNAMICS CORPORATION

1243 Transit Avenue, Pomona, California • Telephone: NAtional 3-1561



POSITIVE DUPLICATION—EVERY TIME!

As surely as a drawing compass can produce identical circles, you can be sure of getting Positive Duplication with these CINCINNATI CENTERLESS GRINDING WHEELS—and with *all* CINCINNATI WHEELS.

This predictable uniformity is the result of Cincinnati's unique 36-step (PD) ° manufacturing process. These rigid controls achieve tolerances for wheel inside diameters which are the "tightest" in the industry. Your (PD) WHEELS have better balance, require less dressing and last longer.

"PD" PAYS OFF FOR YOU

You can meet or beat demanding production schedules with the help of Positive Duplication, because you can reorder a CINCINNATI (PD) WHEEL and know that it will act and grind exactly like the original.

Whatever shape, grade and size you specify . . . centertype, centerless, internal, surface, toolroom or snagging wheel . . . you get Positive Duplication—Every Time!

CUT COSTS . . . CALL CINCINNATI

Cincinnati factory representatives are trained specialists, experienced in grinding job set-ups and operations. Their skills are at your service. Just call your CINCINNATI (PD) GRINDING WHEELS Distributor, or contact Cincinnati Milling Products Division, Cincinnati 9, Ohio.

(PD) POSITIVE DUPLICATION

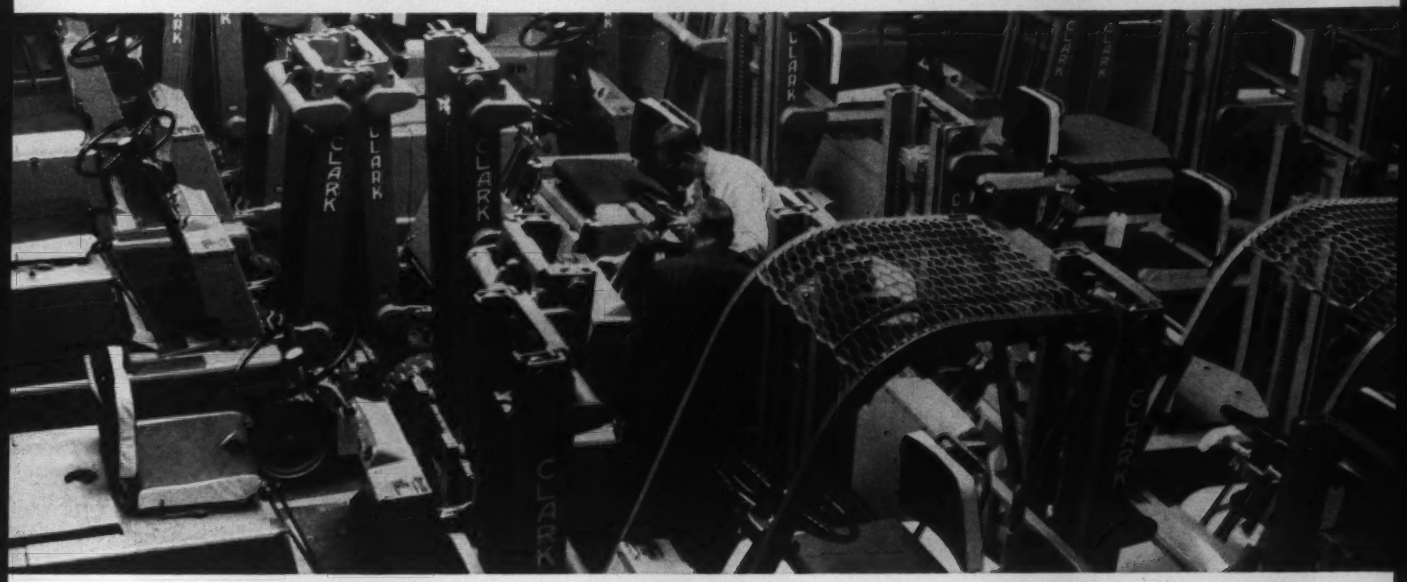
CINCINNATI°

GRINDING WHEELS

°Trade Mark Reg. U.S. Pat Off.

A PRODUCTION-PROVED PRODUCT OF THE CINCINNATI MILLING MACHINE CO.

NOW! A full service rental program



that saves capital, eliminates maintenance problems... rids you of truck downtime!

A new, *flexible* rental system, enabling you to acquire all of your materials handling equipment, with full service arrangements, and *complete maintenance coverage*, is now available.

You save working capital! Without large outlays of capital you take immediate possession of all new materials handling equipment. Your present equipment is purchased at full cash value . . . your only actual capital expenditure is one budgeted monthly payment.

Downtime is eliminated! The Clark Rental System maintains a standby fleet of equipment for your immediate use when an emergency arises. The possibility of delays and losses to downtime are practically eliminated.

No more maintenance! Renting takes you out of the repair business. You no longer need to maintain a special repair shop, an inventory of parts, or special tools and equipment.

You rid yourself of hidden costs! The burden on your cost accounting system is reduced to the bone. Clerical time, rising costs of inflation, and the high cost of using obsolete equipment . . . are all eliminated. One cost is your only cost.

A tailored system! A rental contract is prepared only after a thorough study of your specific operation is made. The flexibility of the Clark Rental System provides you with a *basic* program—without frills or extras—which keeps your handling costs to a minimum.

Compare the advantages for yourself! A booklet describing the rental program in detail, including a cost comparison chart, is available without obligation. For your personal copy, write or wire to the address below.

CLARK
RENTAL SYSTEM

CLARK RENTAL CORPORATION
485 Lexington Avenue • New York 16, N. Y.

The Prime Mover Company, manufacturer of materials handling equipment, says:

Our "Prime Movers" give these 6 parts a terrific beating...that's why they're made of LaSalle

STRESSPROOF®
STEEL BARS
with copper
Strength Without Heat Treating

Engineers of the Prime Mover Company, Muscatine, Iowa, demanded the most dependable steel bars available for six important parts of their transmission assembly. Here are some of the reasons they specified STRESSPROOF!

You don't have to heat treat STRESSPROOF! There's no heat treat distortion.

STRESSPROOF is strong . . . 100,000 psi.

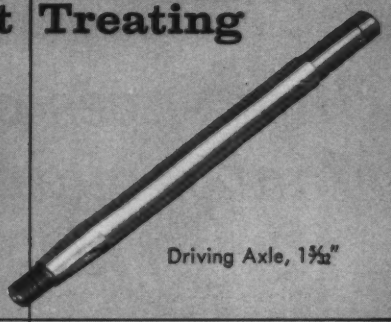
It machines faster . . . at 83% the speed of B1112.

It wears better without case hardening . . . replacing .40 carbon alloy steels and other heat treated and alloy steels, such as 8640, 4140, C1045, C1141, and C1137.

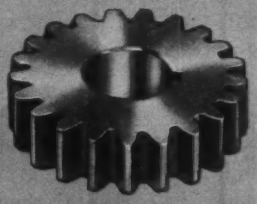
It costs less than heat treated in-the-bar alloys.

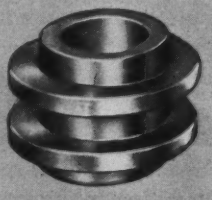
Worm Shaft, 1½"

Input Shaft, 1 5/32"


Driving Axle, 1 5/32"

Shifting Shaft, ¾"


Reverse Pinion, 3"


Bearing Carrier
Clutch Throwout, 2¼"

Use this coupon to request technical bulletin announcing improvements in LaSalle STRESSPROOF *Steel Bars...with copper.*

La Salle STEEL CO.

1436 150th Street
Hammond, Indiana

Please send technical bulletin "Today's Improved LaSalle STRESSPROOF Steel Bars...with Copper."

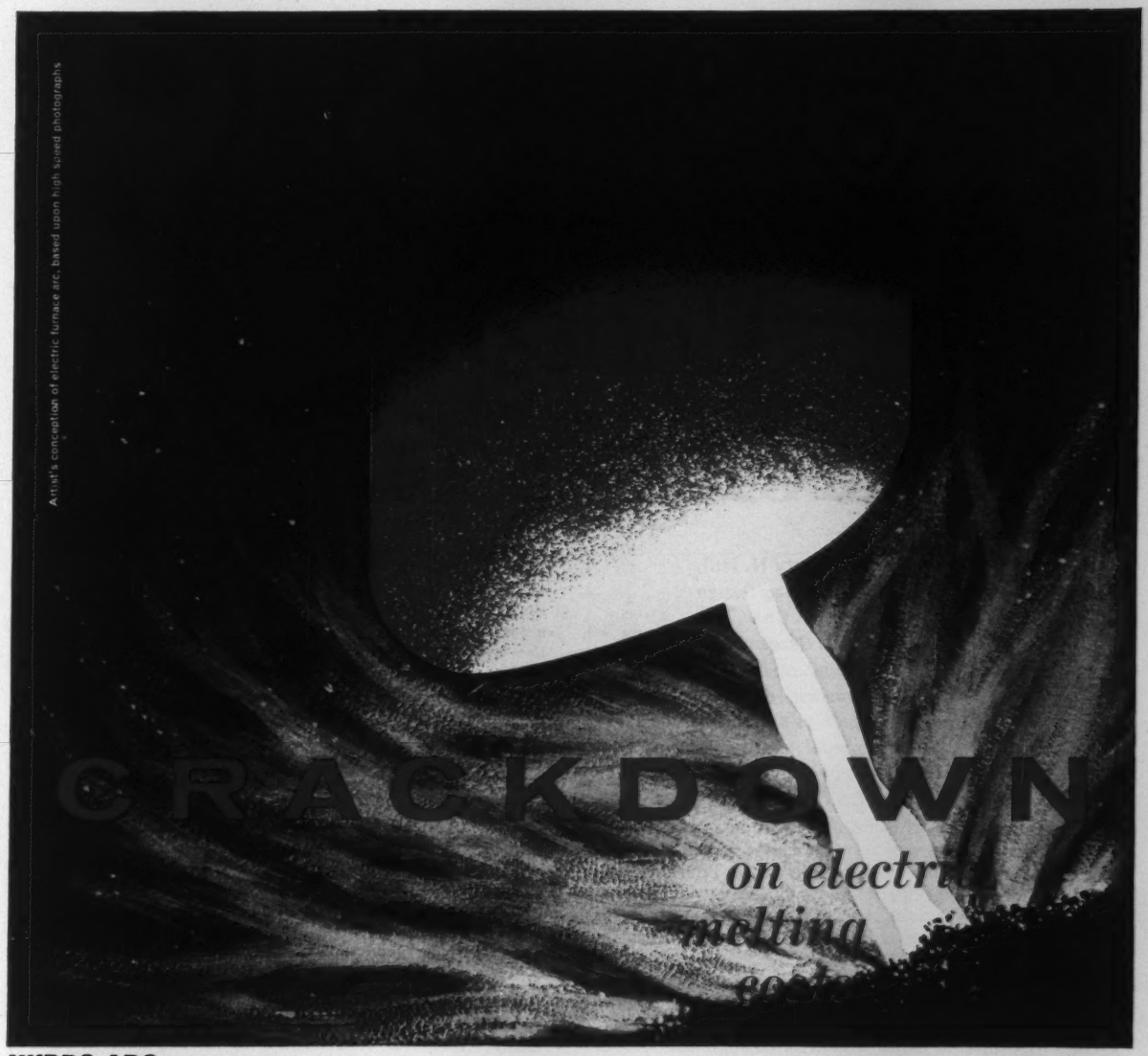
Name_____

Title_____

Company_____

Address_____

City_____ Zone_____ State_____



HYDRO-ARC electric furnaces keep arcs burning at peak intensity every moment—and turn extra wattage into melt. The key: instantaneous electrode movement, monitored by the very *energy* of the arc itself.

Air counterbalanced electrodes and a unique dual motor hydraulic control circuit virtually eliminate troublesome inertia or mechanical lag. When turbulance in the metal charge effects arc gap, electrode reaction is immediate—readjustment is exact! Here is electric melting efficiency you may not have thought possible . . . cost reductions that open many new applications for fast, clean, economical electric melting. Hydro-Arc may put a fresh light on your own plans for additional melting, smelting, or other heating facilities.

FOR MORE FACTS, write for Hydro-Arc Bulletin No. FO-10, or ask a Whiting furnace engineer to call. No obligation. *Whiting Corporation, 15601 Lathrop Avenue, Harvey, Illinois*

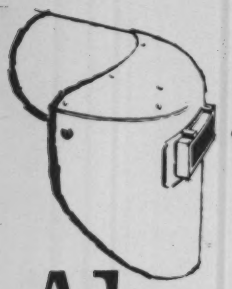
FEMA

87 OF AMERICA'S "FIRST HUNDRED" CORPORATIONS ARE WHITING CUSTOMERS

ELECTRIC FURNACES

WHITING

MANUFACTURERS OF CRANES; TRAMBEAM HANDLING SYSTEMS; TRACKMOBILES; FOUNDRY, RAILROAD, AND SWENSON CHEMICAL EQUIPMENT.



NO. 1 OF A SERIES

"How to Design Welded Aluminum Structures"

Alcoa Research in Strength of Welded

Mr. Harry N. Hill, *Engineering Design Division Chief, Alcoa Research Laboratories, Aluminum Company of America, reports research findings presented at the 1959 annual meeting of the American Society of Civil Engineers.*

For the first time in the industry, Alcoa is publishing an informational series of new concepts in the strength and characteristics of welded aluminum. This new approach to the design problem is based on extensive, continuing investigation at Alcoa Research Laboratories where advanced methods for the use of aluminum structures are being explored.

As you well know, welding heat-treated or work-hardened alloys creates a somewhat weaker "heat-affected zone" in the immediate vicinity of the weld. Outside this narrow region the original high strength of the parent metal is unaffected. Previous design methods, using the old "weakest link" theory, required designers to use the *minimum strength* of the material in the heat-affected zone as the over-all strength of the structural member.

Alcoa research engineers have developed new design rules that far more accurately reflect the *actual strengths* of welded structures of aluminum. A new "reduced-strength zone" concept is used in these new rules. This zone is smaller than the heat-affected zone, as shown in the accompanying graph.

In a member containing a longitudinal weld, *all* the area within the reduced-strength zone is considered to have the minimum strength of the material adjacent to the weld. Beyond this zone, the aluminum is considered to have its original strength unaffected by the heat. *The ultimate or yield strength of such a member is calculated as the weighted average of the strength within the "reduced-strength zone" and that of the metal outside this zone.* Frequently, the reduced-strength zone constitutes but a small part of the total cross section, and the welding has a negligible effect on the strength of the member. This reduced-strength zone concept also applies to transverse and other localized welds. Subsequent articles in this series will treat these welds.

The validity of this new weld strength concept and the resulting design methods have been thoroughly demonstrated by tests of welded members in tension, compression and bending.

The extent of the reduced-strength zone has been exhaustively studied in surveys of hardness, tensile strength and yield strength. Careful analysis of a large body of such data with welded samples up to 2 in. thick has indicated the inert gas, tungsten arc or consumable electrode welding process does not create a reduced-strength zone in excess of 1½ in. from the center line of a butt weld or from the heel of a fillet weld. Experimental repair welds where the weld was chipped out and rewelded as many as *six times* were included in the data. The data indicated that for many welding conditions, the reduced-strength zone is substantially less than the maximum 1½ in. Here, appropriate smaller values can be used for design.

Watch for additional subjects in this series: 10-in. gage length yield strength; strength of welded members in tension; strength of welded members in compression; welded beams; fillet welds and design data.

Call your Alcoa sales engineer for detailed information on "Designing Welded Aluminum Structures," or write Aluminum Company of America, 1761-A Alcoa Building, Pittsburgh 19, Pa.

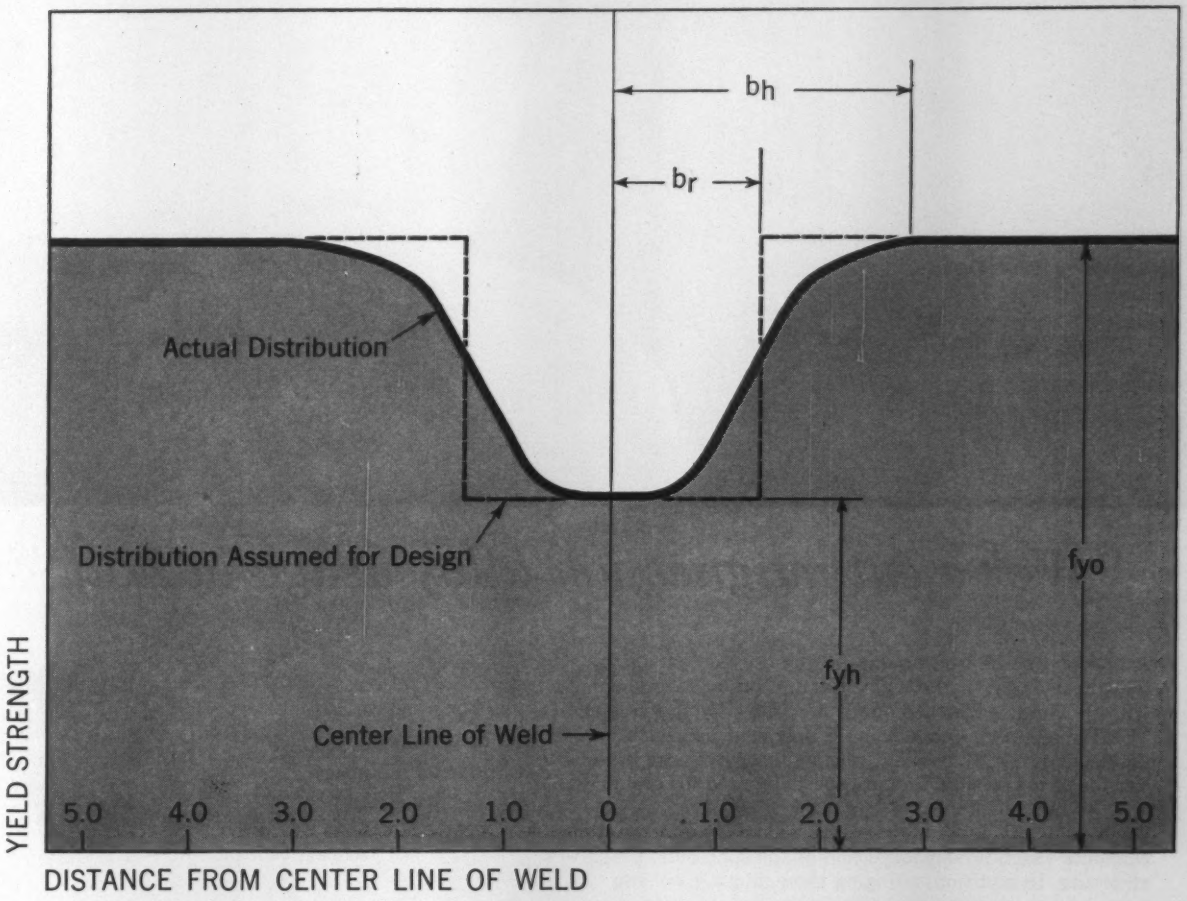
Your Guide to the Best in Aluminum Value

ALCOA ALUMINUM

ALUMINUM COMPANY OF AMERICA

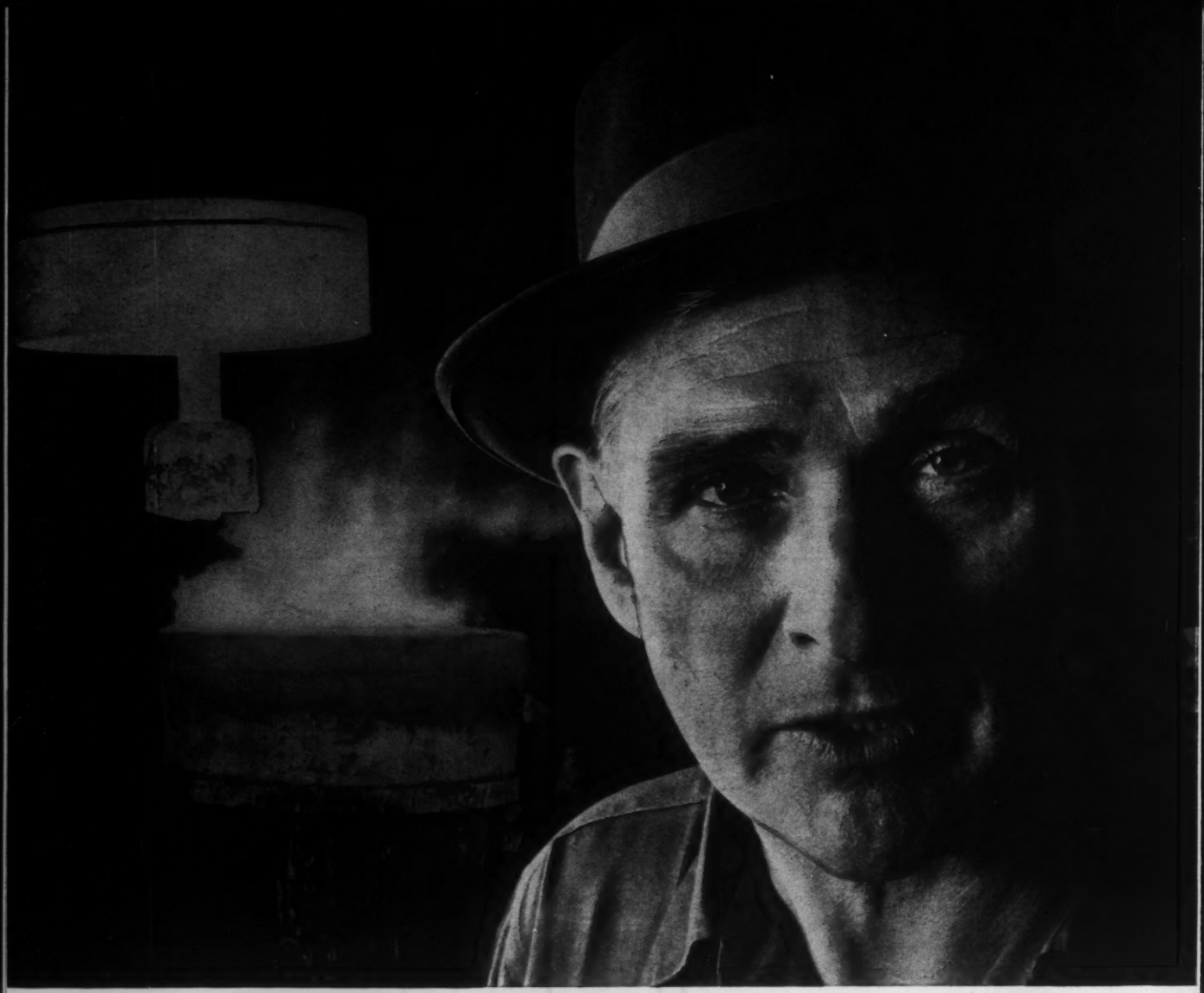
For exciting drama watch "Alcoa Presents" every Tuesday, ABC-TV, and the Emmy Award winning "Alcoa Theatre" alternate Mondays, NBC-TV

Reveals New Concepts Aluminum Alloys



Typical Distribution of Yield Strength Values in Vicinity of Weld

f_{yo} = Yield strength of parent metal unaffected by heat
f_{yh} = Minimum yield strength in heat-affected zone
b_r = Extent of reduced-strength zone
b_h = Extent of heat-affected zone



"We've cut magnesium alloy usage in half"

Attention ductile iron producers who use the "plunging" treatment to get higher recoveries and better magnesium control: UNION CARBIDE METALS offers two alloys for this treatment—"EM" magnesium-ferrosilicon (10 per cent magnesium) and "EM" alloy 55 (30 per cent magnesium). Both are low-cost sources of magnesium and are specially sized for plunging into acid- or basic-melted iron.

These alloys promote higher as-cast ductility and counteract elements which hinder formation of the spheroidal graphite structure. In addition, plunging these alloys gives you magnesium recoveries up to 50 per cent, better structure control, less pyrotechnics, and lower costs. For further information, contact UNION CARBIDE METALS, pioneer producer of magnesium-silicon alloys for ductile iron.

UNION CARBIDE METALS COMPANY, Division of Union Carbide Corporation, 30 East 42nd Street, New York 17, N. Y.
In Canada: Union Carbide Canada Limited, Toronto.

For recommended methods of plunging ELECTROMET magnesium alloys, write for this six-page bulletin.

UNION CARBIDE METALS

Electromet Brand Ferroalloys and other Metallurgical Products

The terms "EM," "Electromet," and "Union Carbide" are registered trade-marks of Union Carbide Corporation.

AMERICAN EXPORTS TOOK A SHARP UPTURN in the last half of 1959 and the export outlook is favorable for this year. Not all authorities agree that Americans have to manufacture in Europe to sell there. In spite of negative factors, the overall markets overseas are encouraging. However, trend toward overseas plants and subsidiaries is increasing.

CONSUMER CONFIDENCE, THE ALL-IMPORTANT FACTOR in business planning, is at a pretty high level. The University of Michigan's survey of consumer attitudes shows that the consumer is in a mood to buy. But sentiment must improve if 1960 is to be a really good year for consumer durables. Most buyers have plans to buy consumer goods "sometime in the near future." Confidence ebbed in the steel strike, but has now rebounded to a considerable extent.

AUTOMAKERS ARE PUSHING HARD TO add more aluminum engines. The Corvair's original aluminum engine is going over so well that Chevrolet may be investing another $5 million for additional equipment in the 1960's. Others are working on new aluminum engines for the near future.

IN SPITE OF GENERAL OPTIMISM, two soft spots may cut into business this year. One is home building, which now tends to run against the overall business cycle because of the habit of federal assistance in recession years. And farm income does not look good. But home building is expected to begin a sharp upward climb in about four to six years.

A SINGLE-UNIFORM MILITARY FORCE may become a reality. Congressmen are more and more convinced that defense efficiency can only be obtained by ending the constant inter-service bickering. But equally important would be centralized procurement, a concept that would mean major savings. It would also mean a new approach in selling to the military.

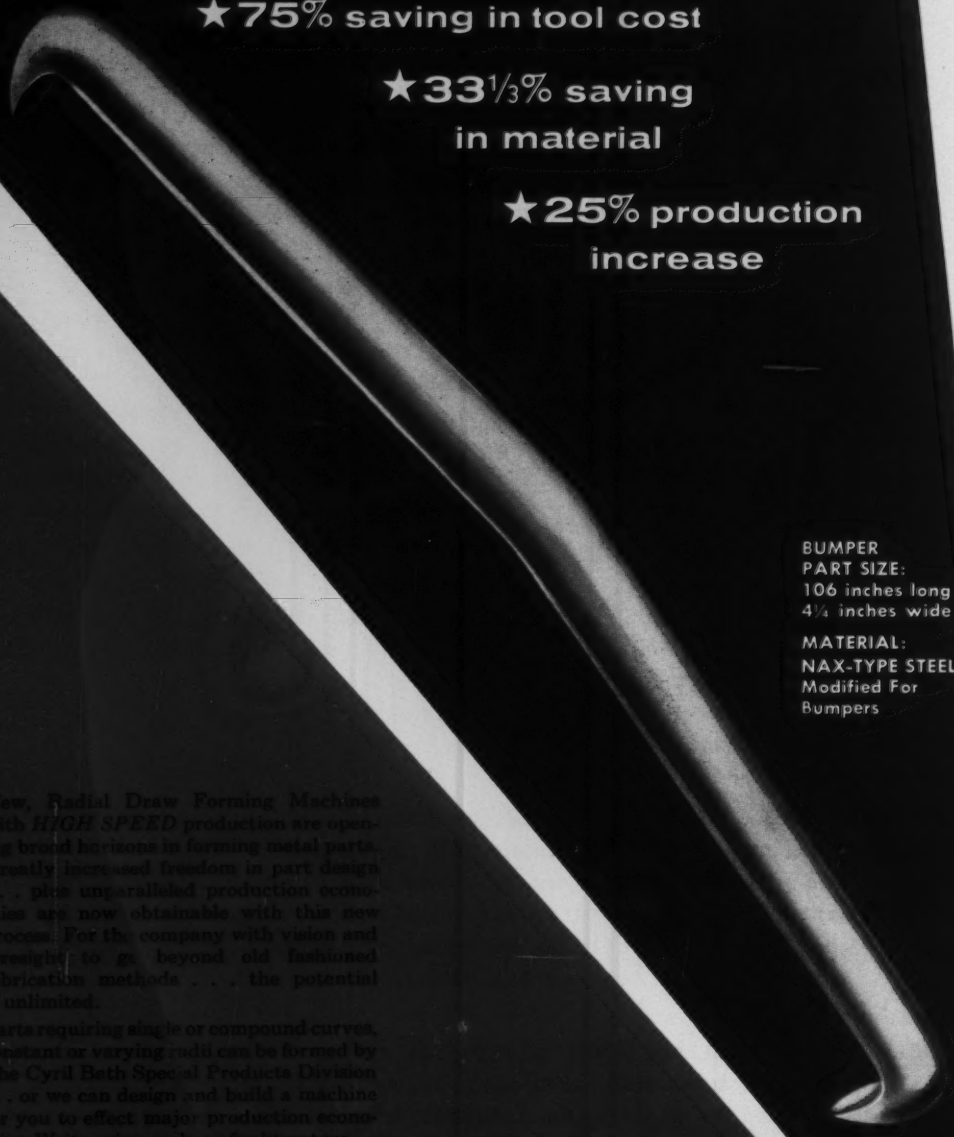
APPLIANCES SHOW EVERY SIGN OF A STRONG YEAR AHEAD. Judson S. Sayre, president of Norge Div. of Borg-Warner Corp., predicts the industry will sell at least 16 million major appliances this year. This compares with sales of 15 million last year. Like the survey of consumer intent (above) the prediction is based, for a large part, on the "consumer frame of mind."

here is a "part-making" *REVOLUTION!*

★75% saving in tool cost

★33⅓% saving in material

★25% production increase



BUMPER
PART SIZE:
106 inches long
4¼ inches wide

MATERIAL:
NAX-TYPE STEEL
Modified For Bumpers

New, Radial Draw Forming Machines with *HIGH SPEED* production are opening broad horizons in forming metal parts. Greatly increased freedom in part design . . . plus unparalleled production economies are now obtainable with this new process. For the company with vision and foresight to go beyond old fashioned fabrication methods . . . the potential is unlimited.

Parts requiring single or compound curves, constant or varying radii can be formed by The Cyril Bath Special Products Division . . . or we can design and build a machine for you to effect major production economies. Write, wire or phone for literature . . .

THE CYRIL BATH COMPANY

33340 AURORA ROAD • SOLON, OHIO
(LOCATED IN THE GREATER CLEVELAND AREA)
Manufacturers of Radial Draw Formers • Dies • Tools
Press Brakes • Tangent Bending Sequence Presses • Press Type Brakes • Special Machines

Why U.S. Firms Put Larger Stake In Europe's Growing Markets

The building of W. Europe's economy has created serious trade problems for American manufacturers.

Many companies are stepping up foreign investments to take advantage of lower labor costs and growing European markets. —By E. C. Beaudet.

▪ "Within ten years, our growth in foreign markets will equal our current domestic sales, and may even exceed that level. We gross about $170 million annually at present."

This prediction by David Karr, president of Fairbanks Whitney Corp., characterizes the changing marketing attitude of many American business men.

Changing Times—It also points up the fundamental shift in world markets taking place since 1950.

For some years the gap between American exports and imports has been steadily narrowing. The buildup of Western Europe's economy (largely with American aid) has cut deeply into American markets both at home and abroad.

Last year, for the first time in modern economic history, the international balance of payments turned against the U. S. A good part of the reason: The heavy investment of American capital in foreign enterprises.

U. S. Investments Climb—Since 1950, American investment in European countries outside the Common Market area rose from $1.1 billion to $2.9 billion in the first half of 1959.

Although smaller, U. S. investment in Common Market countries has grown at a faster rate in recent years. In the same period, it increased from $636 million to $1.9 billion.

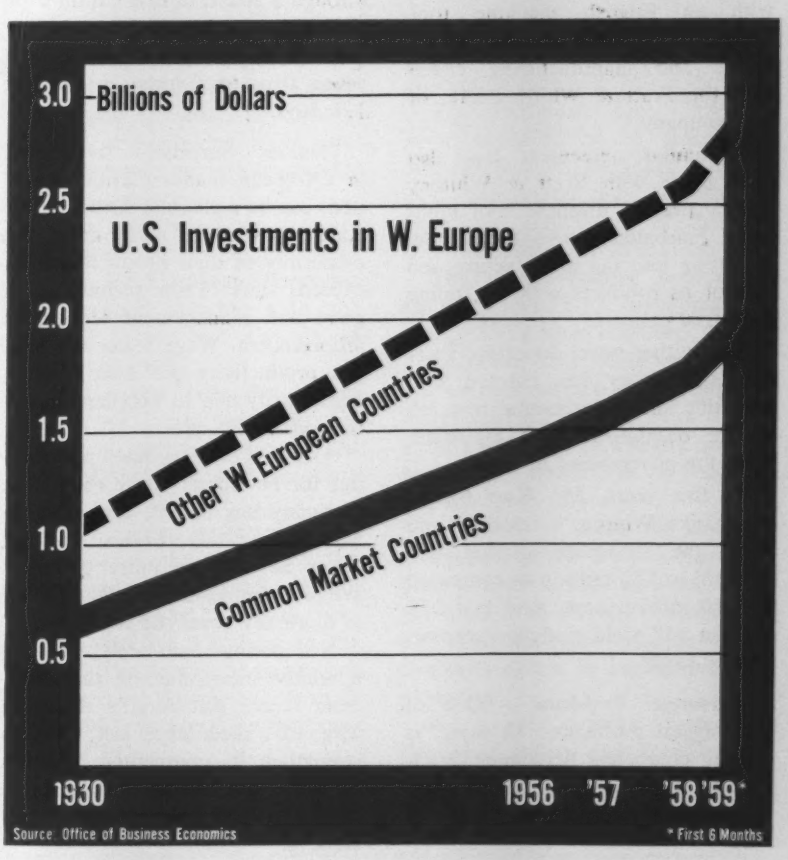
Both areas enjoyed a sharp upswing in U. S. investment during the first half of last year after a recession-caused dropoff in 1958.

Behind the Trend—The lure of a Common Market, roughly the same population size as the U. S. with a rapidly accelerating standard of living, has proved irresistible to American investors.

As Mr. Karr puts it, "Not too long ago, all a European manufacturer needed to offer employees was a bicycle shed. Now they have to provide black-topped parking lots."

Mr. Karr became interested in Western Europe shortly after he became president of Fairbanks Whitney last May. He had to. The

America Steps Up Outlays



MORE ORDERS: "We've been getting millions of dollars worth of valve orders in Europe," says W. F. Rockwell, Jr., president, Rockwell Mfg. Co.

SALES OUTLOOK: Fairbanks Whitney Corp.'s president Karr sees, "Sales in and from W. Europe will rise from $10 to $50 million in 5 years."

company, made up of the former Fairbanks Morse and Pratt & Whitney, had lost some big equipment orders overseas because it just couldn't meet the price.

Going Overseas — As a result, Fairbanks Whitney is going into the European market with both feet. Recently an agreement was reached with an English machine tool builder to exchange licensing agreements and manufacturing rights with the Pratt & Whitney Div. of the company.

A similar agreement has also been made with Pratt & Whitney and a French machine tool company. Fairbanks Morse, meanwhile, is getting into the manufacture and sale of its products with an Italian industrial concern.

In a rather novel direction, Fairbanks Whitney has entered into scientific and experimental research on the desalinization of sea water with the government of Israel.

In five years, Mr. Karr figures Fairbanks Whitney's sales in and from the European market will amount to $50 million as compared to $10 million now. And that $50 million will yield a higher percentage of profit.

Personnel Problems — "One of our biggest problems," he says, "is getting competent personnel to adjust to the realization that we are a part of an international trade picture."

"In the past, executives in charge of foreign operations in many companies were regarded as not much more than order takers. All this has changed with top executive talent being moved into foreign operations."

Fairbanks Whitney is putting foreign operations executives through a round of orientation trips right now. The top four men in this area of the company have logged seven trips to Europe in the last 120 days.

Pleasant Surprise — Investment in European manufacturing operations can be a pleasant surprise, Mr. Karr reports. "In many cases the modernity of their production lines exceeds ours. Their technology is good and management techniques are excellent. Wage scales are low, but productivity per man hour is high, partly due to excellent incentive systems."

As far as offering new opportunities for newcomers from the U. S., Germany has had it, according to Mr. Karr. "Italy, France and the Outer Seven have more potential. We're Johnnies-come-lately as far as Germany goes," he says.

No Johnny-come-lately, but still a relative newcomer on the European scene, Pittsburgh's Rockwell Mfg. Co., took steps last week to strengthen its competitive position in world markets by setting up a wholly owned sales subsidiary in Geneva.

"No one could have predicted the speed with which the European Economic Community has put its program into effect," says Willard F. Rockwell, Jr., president of the company.

Plans Speeded Up—"We have stepped up our own expansion plans accordingly and will eventually manufacture all our products that can be sold in world markets in Europe," he reports.

Rockwell's foreign business now accounts for a little less than ten percent of its total volume. But, Mr. Rockwell says, "I believe our new international setup will help boost this figure to 25 pct during the next few years."

Rockwell's Plans—Rockwell's first move to internationalize its export business was the purchase of a West German manufacturer of small diesel and gasoline engines in 1957.

This wholly-owned subsidiary has been producing Rockwell - Nordstrom valves for world markets for over a year. As a result, Mr. Rockwell says, "We've been getting millions of dollars worth of valve orders we couldn't have got with valves made in the U. S."

A few months ago the company announced a 125 thousand sq ft addition to its main West German plant, the second in two years. Here, Rockwell will turn out liquid meters, several lines of valves, and industrial woodworking power tools.

EXPORT SHIFT: "Product pattern of exports will change", says Commerce Dept.'s Henry Kearns.

Price Competition—These latest moves in strengthening the company's international position Mr. Rockwell attributes to tariffs, quotas, and high labor costs which place American manufacturers at a disadvantage in world markets. The European Common Market, he feels, puts up another barrier to American trade.

"The effect of these conditions," he says, "will make it all but impossible for American manufacturers to share in the world's mass markets unless Americans actually own and operate facilities in the foreign trade areas."

A new development in today's European markets, Mr. Rockwell reports, is increasing price competition. "This is the inevitable result of a reduction in trade restrictions, a situation that American manufacturers have always had in the large coast-to-coast free trade area of the United States."

How Big a Market? — What about those companies which do not have manufacturing facilities and agreements abroad?

According to Henry Kearns, Ass't. Secretary of Commerce for International Affairs, there are some negative aspects. But the overall trend for selling to the European Economic Community is favorable.

"This business of being in the Common Market to be able to sell in it is way overstated. American companies overall have a better chance than ever to sell U. S. made goods in Europe."

He cites the rising levels of European economies and the larger markets created by the European trading blocs as two good reasons why they should make better customers for American made products. But while the overall trend is favorable, he feels it will be marked by changes in the flow of specific products overseas.

Product Lineup—Exports of machinery held just about steady in 1959 compared to 1958 while new passenger cars continued their steady decline since 1955. Steel exports fell below imports as a result of the steel strike.

Biggest import gains made last year were in manufactured goods. Foreign automobiles gained 50 pct; iron and steel products also doubled. Major increases were also made in imports of electrical goods, industrial and office machinery, agricultural implements and tractors.

Balance of Trade—Last year the excess of U. S. exports over imports dropped to $1 billion compared with $3.5 billion in 1958. This was due to the time lag between the recovery of Western Europe's economy and that of the United States.

American exports took a sharp turn for the better during the second half of 1959. The outlook for 1960 is a further widening of our balance of trade.

U. S. exports are estimated to hit $12 billion this year and imports about $6 billion.

U.S. Backs New Trade Group

Growing rivalry between the two European trading blocks has moved the United States to sponsor a new economic organization aimed at improving trade relations between the two groups and North America.

The plan was given full approval by the 18-nation Organization for European Economic Cooperation meeting with the United States and Canada in Paris last week.

In the new setup, the United States and Canada would become full and active members. At present they are only associate members of the OEEC.

Four experts representing the European Common Market, the European Free Trade Assn., other European countries, and North America will draw up the plans. The new trade group, not expected to become active until mid-1961, may replace the present OEEC.

The Europe Common Market consists of France, West Germany, Italy, Belgium, The Netherlands and Luxembourg. Its population runs over 160 million.

The European Free Trade Assn. is made up of Britain, Norway, Sweden, Denmark, Austria, Switzerland and Portugal. Combined population of these countries comes to 90 million.

The rift developing between the ECM and EFTA has worried the U. S. for three reasons:

1. Fear that tariff-cutting moves between the two groups might shut off imports from the U. S. The U. S. and Canada now account for one-fourth of Western European imports.

2. The U. S. wants the more prosperous of the Western European nations to take on some of the burden of foreign economic aid which has contributed to this country's deficit in international payments.

3. A split among Western European nations over economic problems could lead to a disruption of the Western alliance.

Keep Your Eye on "Blow Molding"

New Way to Make Containers Spurs Plastics

Making plastic containers by inflating a blob of plastic in a mold is catching on fast.

It will help push plastics output to new records, and also offers a vast new market to moldmakers.—By K. W. Bennett.

▪ A boom within a boom, the growth of "blow molding" in the plastics industry, is one for metalworkers to watch. The method inflates a blob of melted plastic in a mold. The end product can range from a king-size container for industrial chemicals to a Christmas tree ornament.

To the metalworker, it means a new mold market with a rate of growth that dwarfs the quick climb of plastics production in general. In 1959, 53 million lbs. of polyethelene plastic was used in blow molding of plastic containers. The figure is expected to hit 73 to 75 million lb this year, and will soar to 170 million lbs by 1965. This does not include a rapidly growing poundage of cellulose base plastics.

Appliances and Autos—The detergent container market alone is presently capable of absorbing 40 million lbs of "blow molded" plastic, alone. And the method is being considered for automotive gas tanks, vacuum and hydraulic cylinders, arm rests, and glove compartment forms.

Next market target is the appliance industry. First applications will probably be in air conditioner housings and ducts, refrigerator linings and parts, and gear housings.

Demand for Dies—At least 40 new blow forming plants were set up in a five-month period of 1959. A single firm has 50 new machines going in. It's estimated that at least 200 machines went into service during 1959.

Metalworkers already produce molds in aluminum, beryllium copper, steel, and kirksite. They are machined, hobbed, or cast; depending on the degree of tolerances required in the finished plastic molding.

This report by W. C. Bracken, Hercules Powder Company, keynoted the strong plastics outlook at the Society of Plastics Engineers meeting at Chicago.

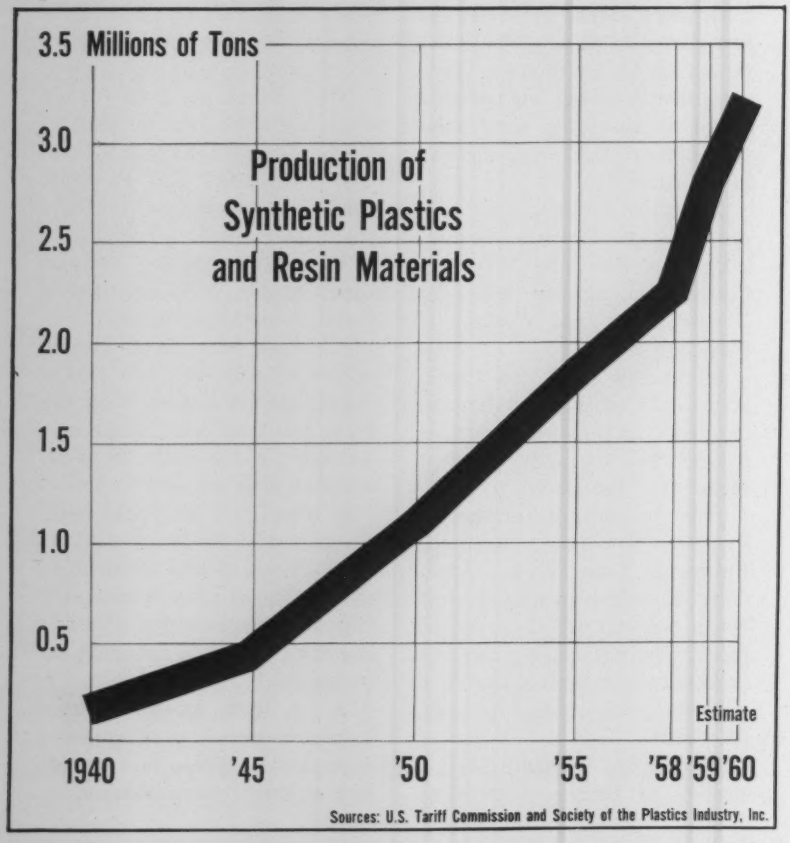
Plastics Progress—Other developments in the plastics field:

Polypropylene fibers are now available in tensiles of 100,000 psi coupled with high creep resistance.

Metalized Plastics—Vacuum metalized plastic parts continue to slip into jobs where die castings have been used in the past. Researchers have vaporized aluminum, beryllium, chromium, magnesium, nickel, tin, and zinc (among other metals) for deposition on a plastic part.

As a cost cutter, the metal coated plastic part can beat a conventional die casting only if the die casting must be given buffing and polishing treatment. Nontheless, metalworkers are finding applications where the method will cut costs, and this use is rising.

Plastics: New Records Each Year



CUBAN HOLDUP: Freeport Nickel Co. has halted work on its Cuban plant pending more settled times.

U.S. Opens Its Nickel Locker

The 35 million lb available from DPA stocks takes the strain off the domestic market.

The future of Cuban capacity now looms as the critical problem.—By F. J. Starin.

▪ The slight storm clouds that had been forming on the nickel supply horizon, were blown away late last week.

General Services Administration announced it had 19 million lb of cathode nickel for sale to U. S. consumers, at the market price, fob point of storage. Also, GSA will pay International Nickel 16 million lb on an old contract, making a total of 35 million lb of nickel available over production.

There was little doubt the overall supply of nickel for U. S. consumers this year would be adequate. But with Cuban capacity in doubt, there were some fears that tight spots would develop along the way.

First Half Clear — Conservative sources now say that, with the added government nickel, the supply is secure for the first quarter and probably for the entire first half.

The nickel business will be better this year. Commerce Dept. figures a 15 pct gain. Albert Gagnebin, sales vice president, International Nickel, agrees.

The release of government nickel takes the strain off consumers for at least the first half, but it doesn't provide answers for some of the immediate problems. Cuba is the big question.

The U. S. government owned Nicaro smelter (capacity—54 million lb) while not shipping regularly, has been working regularly and has good stocks on hand.

Freeport Troubles—But the other nickel plant in Cuba, owned by Freeport Nickel Co., is in trouble. A new Cuban mining law taxes exported nickel at 25 pct of its value. Freeport executives say they can't even break even, much less turn a profit with such a tax. The company must still invest several million dollars to complete the facility.

Both sides have been willing to negotiate. Eventual settlement seems likely along these lines: The Cuban government would buy Freeport's nickel output and sell it back to the company. Cuba's cut would be determined by the difference in prices.

Freeport's strongest argument appears to be that its refining methods are new, and that Fidel Castro, the controversial revolutionist, would be hard pressed to finish and run the plant.

Boom in Europe — Castro has been pointing to the booming demand in Europe for nickel. His spokesman have hinted, in closed talks, that Russia needs more nickel than it can produce and might finish and operate the plant.

The boom in Europe is not to be taken lightly. Demand there is climbing more sharply than here. In fact, insiders say that when International Nickel's report on 1959 business comes out, it will show the company had a very good year despite the long steel strike in the U. S. Demand from Europe made the difference.

Scrap Industry Faces Challenge

It Pushes Research Program to Upgrade Its Product

The scrap industry realizes it is entering a period of change due to new steelmaking methods.

It hopes to find ways of making its product more attractive to its customers. — By R. D. Raddant.

▪ The scrap industry and the people who form its ranks are headed into a period of change.

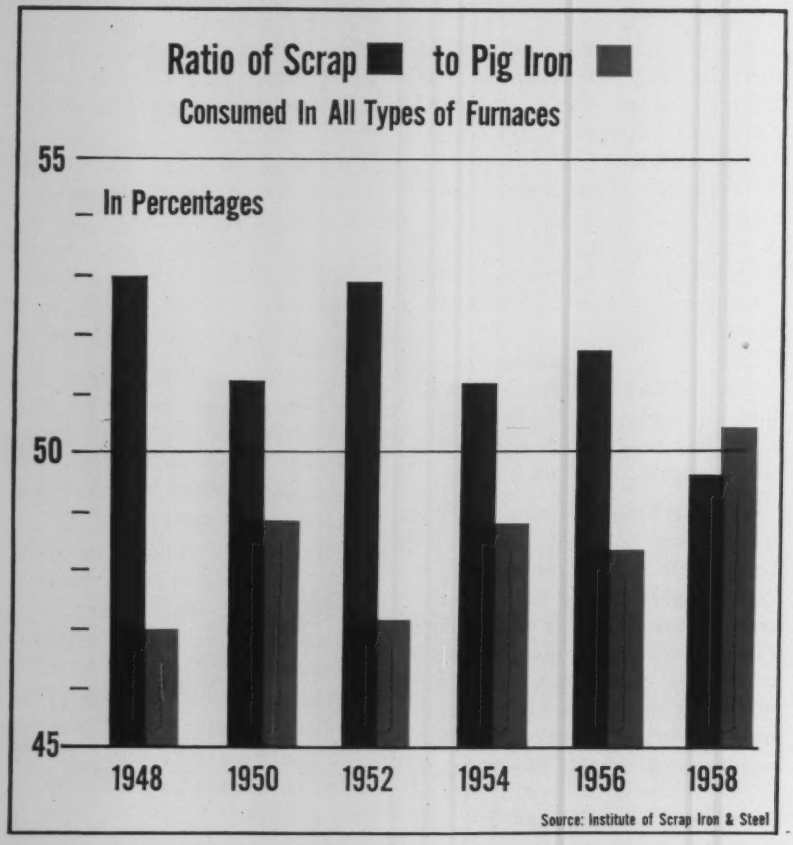
Only a few diehards expect the scrap market to follow its traditional ways. Others recognize that changes in steelmaking technology are already bringing major changes into the scrap market.

Bright Outlook — Right now, most scrap men are optimistic. Cheered by the steel settlement and the outlook for near capacity operations for months ahead, they expect to sell some 34 million tons of scrap this year.

This includes better than four million tons for what appears to be a strengthening export market this year.

But, at the same time, they are looking at developments in the steel industry with some concern. Emphasis on oxygen steelmaking and more use of hot metal in open-hearth charges throws a shadow over the long-term outlook.

Hot Metal Displaces Scrap



Oxygen's Impact — Last week when the Institute of Scrap Iron and Steel met in Miami Beach, a record group postponed their visits to the pool and beach to hear G. W. Kelly, general purchasing agent, Kaiser Steel Corp., discuss oxygen steelmaking and its impact on scrap.

Mr. Kelly pointed out that oxygen steelmaking uses less scrap in its charge than conventional open-hearths, but made most of his points on scrap quality.

"All indications point to the fact that we can expect to be producing more steel within the next five years," he said. "This, of course, is bound to create a greater demand for your product. However, it doesn't mean that the steel industry will absorb all of the product you produce unless they meet the quality requirements. You must keep pace with us in improving methods, processes, and techniques in the production of scrap."

Quality Control — Most of the forward-looking men in the industry are ready to concede that some changes are due. Outgoing president Myron L. Chase reported that the Institute had initiated a research program "designed specifically to help meet these primary challenges of the 1960's."

The program, he pointed out, is directed to improving scrap quality by devising techniques for the scientific inspection and evaluation of scrap.

"We hope," he said, "that research will also reveal more efficient and economic scrap preparation techniques."

More Hot Metal—From a short-range viewpoint, most signs point to more use of hot metal and less use of scrap in steelmaking. Ore beneficiation and new techniques are making more hot metal available. New steelmaking techniques

call for a higher percentage of hot metal. And many mills point out that they can supply normal needs without buying dealer scrap.

But the scrap industry has one strong economic fact working for it. The scrap supply can be increased without increasing investment costs. With capital dollars hard to find, this is a big factor. Two major mills are reported interested in Kaldo oxygen vessels because they use a relatively high percentage of scrap and can be installed without increasing blast furnace capacity.

But most of the major expansion projects scheduled or being discussed call for oxygen vessels. This technique calls for about 30 pct scrap as maximum. Kaiser's Kelly told the Institute that they believed it possible to increase the scrap charge to 50 pct, but that this will require much improved refractories, not yet available.

EXPORT OUTLOOK: Scrap moving out of Philadelphia, above, is headed for foreign mills. Strong demand from Europe and Japan is expected.

Scrap Charge Cut — In openhearth practices, other factors favor hot metal. When oxygen roof jets are used, there must be more iron. These and other considerations have cut the scrap percentage of furnace charges. Five years ago, an average mill might use about half scrap and half hot metal. Today, the same openhearth shop uses about 40 pct scrap.

This has tended to reduce mill reliance on open market scrap. One mill used to figure it could get by without dealer purchases until the operating rate went over 75 pct. Now, the same mill feels 80 pct is the cut-off point.

If steel operations fall into the 80's pct during the second half, the scrap market will be far from the boom stage.

Factors Favoring Scrap—Against these uncertain developments, most scrap men are on the bullish side now. It's true that mill purchases have not been up to expectations since the settlement. But with operations in the high 90's, mills will have to take in large tonnages.

The threatened ore shortage will no doubt affect the scrap market in two ways. More turnings will be needed for the blast furnaces, and the openhearth charge will have less hot metal in the companies that are threatened with the pinch.

Exports Expands — Another factor is export, which now looks stronger than at any time since 1957. What's more, the timing on the export market is on the side of the scrap dealers and brokers.

While the steel companies are taking it easy and not rushing into the market, strong orders are shaping up for the East and West coasts and, later, for the Great Lakes.

Big buyers will be Japan, West Germany, and Britain. The possibility is that these big shipments will materialize in February and March, just when the ore pinch is tight.

Great Lakes Shipping—Another factor in export is the development of Great Lakes cities as export markets. Until the channels are fully developed, Lakes cargoes will be small and not large enough to take full advantage of the St. Lawrence seaway.

Some Midwest dealers in high-alloy scrap also made important export sales in 1959 and expect to do better in 1960.

Officers Elected — New officers elected by the Institute are:

President—Milton K. Mahler of Morrow Steel Co., Detroit.

First vice president — E. J. Moskowitz, Schiavone Bonomo, Jersey City, N. J.; second vice president—Harry Marley, Marley's Div., Abe Cooper-Syracuse Inc., Syracuse, N. Y.

Treasurer—Ralph N. Kopelove, Kopelove Iron & Metal Co., Dayton, O.; secretary—I. D. Shapiro, United Iron & Metal Co., Baltimore.

Directors Named—Four new directors at large—Albert I. Monheim, Louis Berkman Co., Steubenville, O.; Aaron Brenner, F. Perlman & Co., Memphis; Arnold Weinstein, Independent Scrap Iron & Metal Corp., Brooklyn, N. Y.; and Joseph S. Summer, Summer & Co., Columbus, O.

Edwin C. Barringer, executive vice president for over 20 years, will retire as of April 30. He will assume the role of consultant for three years. William Story, director of public relations, was appointed assistant executive vice president.

Steel Stresses Product Identity

New Steelmark Will Label Products Built of Steel

An all-out drive has started to make sure the consumer knows the products made of steel.

It's aimed at combating some of the sales inroads made by aluminum, plastics and imported steel.

▪ The steel industry is launching a drive to merchandise steel and identify products made of steel at the consumer level.

The program, coordinated by the American Iron and Steel Institute, is built around a distinctive identifying symbol adopted by the industry —the Steelmark. This symbol consists of three hypocycloids plus the word "steel". When appropriate, identifying words like "galvanized" or "stainless" will be added.

Three Varieties—The four-color Steelmark will be presented initially in three sizes of hang tags, gummed labels and pressure-sensitive stickers for attachment to consumer products made of steel. It will also be available for use on company advertisements, catalogs and sales literature as well as stationary and postal cancellations.

Some of the tags will carry advertising copy aimed at heightening consumer interest in products made of steel. Use of the tags and labels will be controlled, with supplies available only to domestic steel producers. No company or brand identification will be used on the Steelmark, although it will be used in individual company advertisements.

What Survey Proved—Designed to meet competition from aluminum, plastics and imported steel, the new symbol was developed after a national survey revealed that consumers frequently do not identify products as made from steel. The same survey showed, however, that the public considers steel a sign of quality, reacts favorably on learning that products are made of steel.

"We want to be sure the American consumer has the correct modern image of steel in his mind," says Benjamin F. Fairless, AISI president. "Products of steel can be light, modern and outstandingly stylish. At the same time they offer the durability, reliability and modest cost for which steel is famous."

Sales Crusade—"The adoption of the Steelmark program ushers in a new era of salesmanship in the steel industry," says Norman W. Foy, chairman of AISI's Committee to Promote the Use of Steel, and vice-president, sales, Republic Steel Corp. The program, "comes at the start of a decade which will carry steel salesmanship closer to the retail level than ever before."

Foy points out extension of steel's sales effort on that level will contribute to sales, and may add to the development of new steel.

"The point of sale is unmatched as a source of information on market possibilities for new products, many of which require new qualities in steel."

Good Response — The industry has high hopes for its new program. Similar programs for other materials have been successful. (Stainless producers are dropping their old symbol to join the Steelmark campaign.)

Initial response from the steel customers has been excellent. U. S. Steel, which tested the Steelmark, reports requests for 12 million tags in a 10-month period.

STEEL SALES SYMBOL: Steelmakers will launch a major program to sell steel and products made of steel around this new Steelmark. Examining it are B. F. Fairless, president of the American Iron and Steel Institute, and Norman W. Foy (right), chairman of its Steel Use Committee.

Where All the Money Will Go

Here's a breakdown on how President Eisenhower proposes to spend the major portions of his $80 billion budget in the 1961 fiscal year beginning July 1. Totals in Billions

	Defense	Space	Atomic Energy	Stockpile	Farm Program	Foreign Aid	Interest on Debt
Fiscal Year 1960	$41.0	$0.3	$2.7	$0.1	$5.1	$3.2	$9.4
Fiscal Year 1961	41.0	0.6	2.7	0.2	5.6	4.1	9.6

Defense Key to Balanced Budget

President proposes to hold the line on defense, but with a big change in emphasis.

How Congress reacts holds the key to a balanced budget for 1961.—By N. R. Regeimbal.

■ Clouds are already forming for the coming massive election-year debate over this country's defense-space program, centered on President Eisenhower's hold - the - line $79.8 billion budget.

Although the President is proposing a sharp speedup in this country's transition to a missile-nuclear age, opposition Democrats in Congress are honing a sharp edge of criticism that the country lags behind Russia because of the "fiscal straitjacket" the Administration has put on defense spending.

The Fine Print — The President proposes only a $50 million boost in total defense spending this year, to $40.95 billion. But the significance lies in the subtotals—a reduction of $1.4 billion in manned aircraft procurement which will be used for sharp increases in missile procurement and all types of research.

The Pentagon, in the future, will be spending less of its total for traditional hardware, more and more for research and expensive electronic devices.

Eyeing the Surplus — Congressional leaders, already setting up their defense program investigations, are eyeing President Eisenhower's huge $4.2 billion surplus to finance some possible boosts in defense spending.

The surplus on paper will come from an expected $5.4 billion boost in revenues, stemming mostly from booming economic conditions, and partly from some new revenues, such as higher postal rates which are doubtful. He proposes to increase total spending by only $1.4 billion.

Budget Blueprint — Here's the president's fiscal blueprint for the country for the 12 months beginning next July 1:

Taxes—No tax cuts this year. Continue present corporation and excise taxes for at least another year. Boost the Federal gasoline tax by ½¢ a gallon to help finance the highway program. Strengthen the crackdown on tax cheaters.

Defense — Continue spending at about $41 billion. Manpower to remain at current levels. Total aircraft procurement, down by $1.4 billion to $4.7 billion. Missile procurement up by $581 million to $2.9 billion. Ship procurement will be up $240 million to $1.7 billion, much of it for nuclear-powered submarines and missile ships.

Space—Spending for non-military space activities almost doubled, to $600 million. First man in space attempt may come in the next fiscal year. Four moon or other planetary probes and at least eight major satellite projects are included.

Inflation—Use the expected $4.2 billion surplus for reduction of the $290 billion national debt. This will remove pressure on private money supplies and credit rates and pare $200 million a year from the interest on the national debt.

Revenue—Boost postal rates another penny for both first class and air mail to remove most of a $550 million postal deficit. Boost tax on aviation fuels from 2 to 4½¢.

Legislation—President seeks to tighten antitrust laws, authorize loans and grants to depressed areas, limit farm subsidies, widen coverage of unemployment compensation, extend minimum wage-hour law coverage.

Steel Conquers the River

PERFECT FIT: The 239 ft center span of Republic Steel Corp.'s new coke conveyor fits right into place. The new system will replace train hopper-car haulage across Cleveland's Cuyahoga River. Completion of the project is expected by late spring.

Weather Boosts Ore Shipments

An unseasonably warm December gave iron ore shippers on the Great Lakes an unexpected break in helping soften the shortage at blast furnaces. The heaviest December shipments in history in the Lake Superior district—3.1 million tons—brought the final figure for 1959 to 46.6 million tons, according to figures of the American Iron Ore Assn., Cleveland. A new late closing date was also set when the final cargo was loaded at Two Harbors, Minn., Dec. 20.

Despite the last minute rush and an early starting last Spring, the season was the worst since the 1930s due to the steel strike which idled all but about 15 pct of the fleet.

Import ore flooded in during the strike and continues through the winter. Imports through September hit 24.8 million tons, according to figures of the U. S. Bureau of the Census. Biggest shippers were Venezuela at 9.7 million tons, Canada at 9.2 million, Chile at 2.6 million and Peru at 1.2 million.

NLRB Decision Favors Plant

A plant which closes down rather than deal with a union must rehire its original employees if it ever reopens, but does not owe them back pay, a National Labor Relations Board majority says.

The NLRB says that the Barbers Iron Foundry, of Bridgeton, N. J., can only be required to offer its employees jobs if it reopens, even though it holds that closing to avoid dealing with the union violates the Taft-Hartley Act.

Two members of the Board, in dissenting, say the majority finding is "woefully inadequate" and permits a guilty employer to get away "scot free." Another member, also dissenting, says that the closing to avoid unionization is not a violation of the Taft-Hartley Act.

Canadian Steel Output Up

Canadian production of steel ingots for November, 1959, amounted to 523,219 net tons. This is an average daily rate of 100.8 pct of rated capacity, and compares with 482,878 tons or 73.7 pct for November, 1958.

For the 11 months ending with November, 1959, production of steel ingots totalled 5,266,984 tons compared with 3,832,158 tons in the corresponding period of 1958.

In the week ended January 2, 1960, Canadian steel mills operated at 101 pct of rated capacity to produce 122,658 tons of ingots, against a rate of 84.2 pct, with output of 102,231 tons of ingots in the Christmas week.

Timken Guarantees Bearing Prices

Timken Roller Bearing Co. has guaranteed its bearing prices to its original equipment manufacturing customers for production purposes in 1960.

The announcement comes as Timken is negotiating a new contract with the United Steelworkers.

M-H Orders Largest Vacuum Furnace

Midvale-Heppenstall Co., Philadelphia, has placed a contract covering the world's largest vacuum melting furnace.

The furnace will be designed to melt electrodes of alloys and steels of varying composition. It will employ the consumable electrode method. Ingots will be cut 40 in. in diameter and weigh 25 tons.

Basic design will follow that of furnaces previously built by Heraeus GmbH, Hanau, Germany, which will supply some of the vacuum and electronic control equipment.

Consolidated Vacuum Corp., Rochester, N. Y., a subsidiary of Consolidated Electrodynamics Corp., will be responsible for construction and installation.

MORE MILLIONS OF OPERATIONS

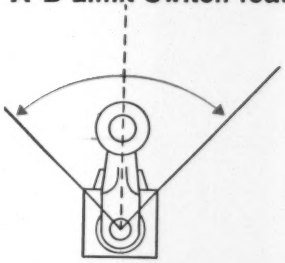
with Allen-Bradley Limit Switches

There's nothing now on the market to match the reliability and trouble free performance of Allen-Bradley Bulletin 802T limit switches. They are completely oiltight—operating heads and switch bodies are sealed against oils, coolants, and metal chips. Operators cannot become sluggish or "stick" in operation—contacts cannot become fouled. The double break, silver contacts are always in perfect operating condition—and remain so without maintenance.

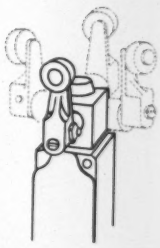
Insist on Allen-Bradley—the *quality* line of limit switches that will give you *many more millions* of trouble free operations.

Bulletin 802T Micrometer Adjustment Roller Lever Limit Switch ▲

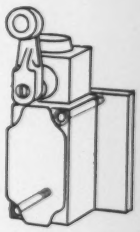
A-B Limit Switch features mean more life, more dependable trouble free service

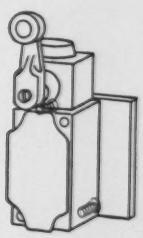


REPETITIVE ACCURACY—Unique toggle blade action assures operation at precisely the same point each time, without adjustment.



FLEXIBILITY—All operating heads can be rotated and fastened in any of four positions 90° apart.





FRONT MOUNTING **REAR MOUNTING**

All Allen-Bradley Limit Switches can be mounted either from the front . . . or from the rear.

1-60-MR

SEE OTHER SIDE FOR TYPICAL APPLICATIONS →

ALLEN-BRADLEY

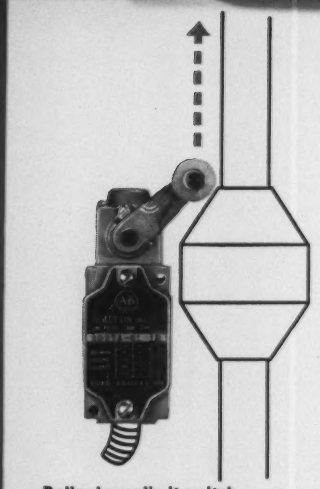
Member of NEMA

Allen-Bradley Co., 1316 S. Second St., Milwaukee 4, Wis. • In Canada: Allen-Bradley Canada Ltd., Galt, Ont.

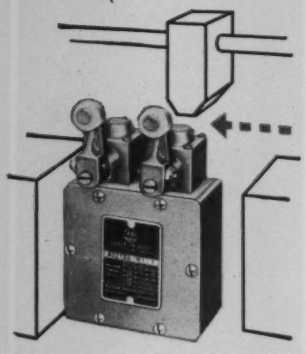
QUALITY MOTOR CONTROL

Allen-Bradley has an Oiltight Limit Switch to meet your exact needs!

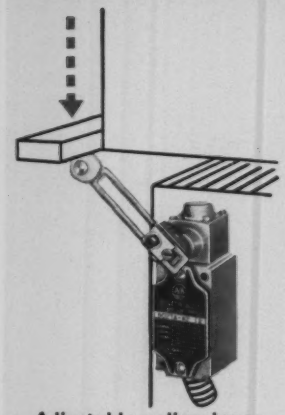
From among the wide variety of Allen-Bradley oiltight limit switches, you are certain to find the exact type to satisfy your specific requirements. If you do not, then please discuss *your* problem with us. A-B limit switches are available with many different levers, lever-contact actions, operating forces, and actuator motions—in spring return or maintained contact construction. A new 16-page illustrated booklet on this *quality* line of A-B oiltight limit switches is just off the press. Write for it!



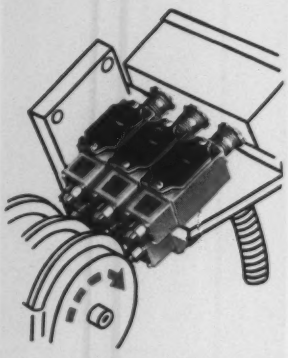
Roller lever limit switch—Here it is operated by dog on vertically moving shaft.



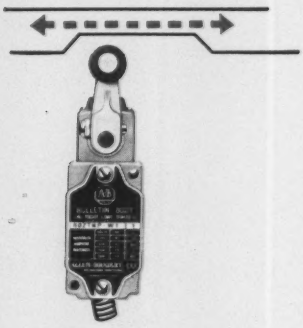
Duplex limit switch where block can also trip second switch for safety insurance.



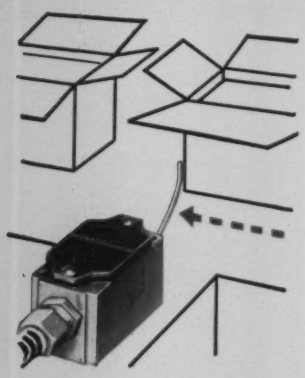
Adjustable roller lever switch. Lever set for operation at greater than normal distance.



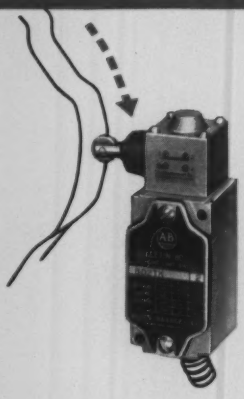
Top push roller limit switches are frequently operated by rotating cams on machine tools.



Neutral position switch—moving bar closes separate contacts as it moves each way.

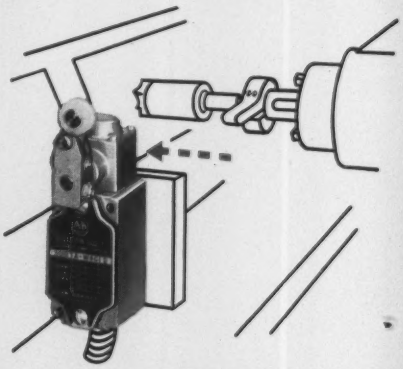


Cat's whisker limit switch is actuated by movement of lightweight units on conveyor.



Side roller limit switch, as illustrated here, is being actuated by a rotating cam.

Fork lever maintained contact switch—adjustable dogs trip one roller in each direction.



Micrometer adjustment switch for precise setting of trip point in machine tool operations.

1-60-MR

ALLEN-BRADLEY

QUALITY MOTOR CONTROL

Member of NEMA

Allen-Bradley Co., 1316 S. Second St., Milwaukee 4, Wis.
In Canada: Allen-Bradley Canada Ltd., Galt, Ont.

Harry E. Chesebrough

A Top Man in Automaking

The head of Chrysler's Plymouth, De Soto, Valiant Div. possesses a wealth of experience.

Harry Chesebrough is one of the top men in the automotive engineering field.

HARRY E. CHESEBROUGH: "Valiant—Not a small car."

▪ It takes years of work, experience and learned know-how to become a first rate auto engineer. Harry E. Chesebrough, vice president of Chrysler Corp. and general manager of Plymouth-DeSoto-Valiant Div., and president of the Society of Automobile Engineers, possesses these necessary requisites.

Mr. Chesebrough began his automotive career in 1932 when he joined Chrysler and attended the Chrysler Institute of Engineering. His first assignment after graduation from the institute with a master's degree in automotive engineering in 1934 was in the company's mechanical laboratory. From there he advanced steadily to positions of greater responsibility.

The Climb — In 1937 he was made supervisor of the transmission laboratory and a year later became supervisor of road test operations. Later he became assistant engineer of De Soto Div. and during World War II was a project engineer for De Soto aircraft production. In 1945 he was named chief engineer at De Soto and remained in that position until becoming chief engineer of Dodge Div. in 1949.

Within a year he was appointed assistant chief body engineer of Chrysler Corp., and a year later became chief body engineer. Five years ago he became executive engineer, product planning and programming, of the Engineering Div. In January, 1957, Mr. Chesebrough was named corporate director of product volume planning, and was named to the Corporate Operations Committee.

At the Top—In 1958 he was elected a corporation vice president and appointed general manager of the Plymouth Div. When Plymouth and De Soto were combined last May he was named manager of the newly formed division.

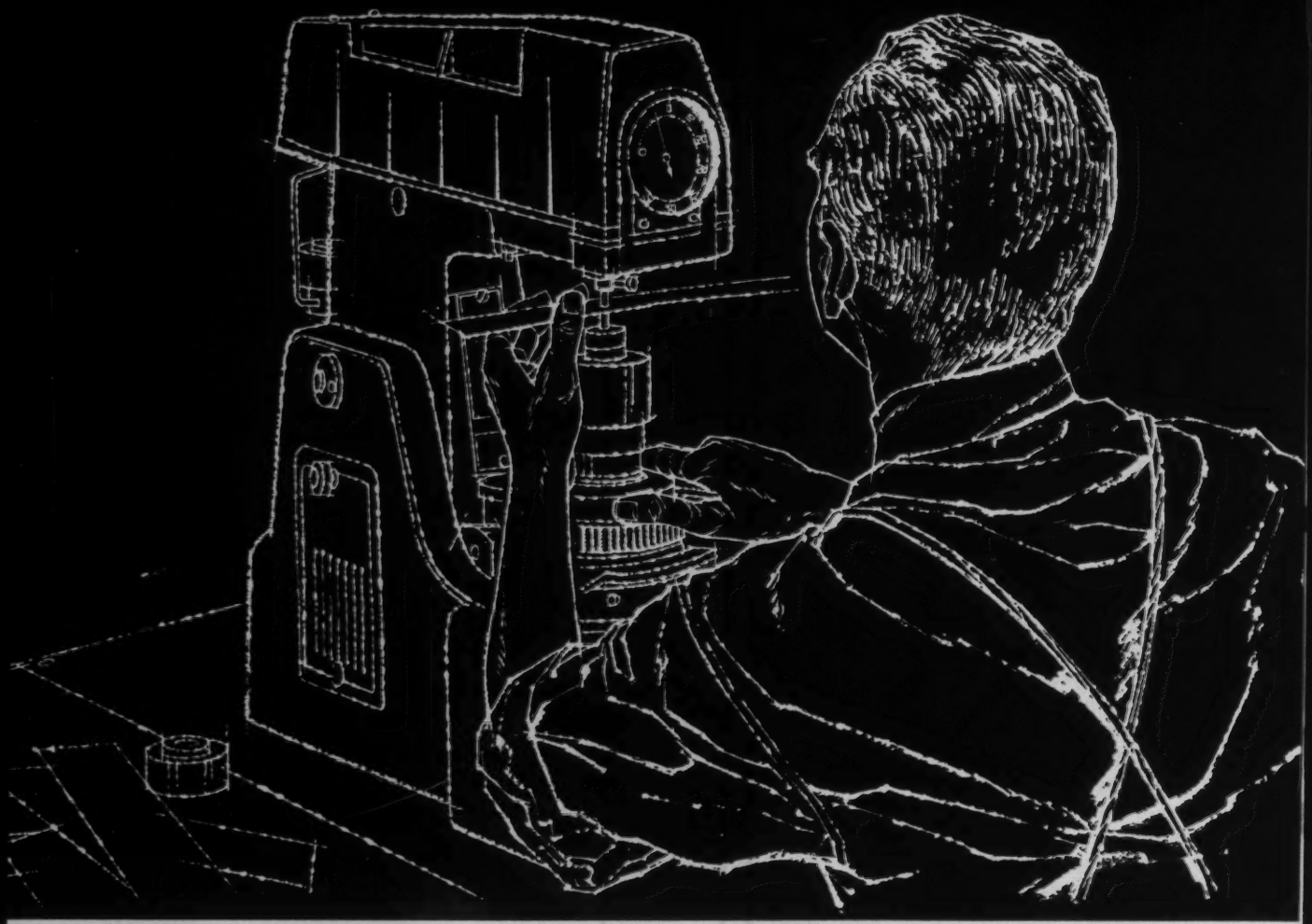
In talking about the Valiant, Chrysler's compact car, Mr. Chesebrough says he had been working on such a model almost from the time he started at Chrysler.

Bad Wording—"I'm against calling it a small car," he says. "This is a big country and people want a useful car. They want an economical car. But they don't want it to be called small."

Mr. Chesebrough is a good mixer who likes young engineers. He has always had an interest in youth and surrounds himself with young people both at work and in recreation. This is in evidence especially at work where most of the men reporting to Mr. Chesebrough are in their thirties.

He is a member of the board of directors of the American Standards Assn., and several professional, social and honorary societies. His hobbies include bowling, sailing, hunting and fishing.

Mr. Chesebrough lives with his wife in Bloomfield Hills, Mich.



PRECISE HARDNESS CONTROL

to your specifications with

J&L Cold Rolled Strip Steels

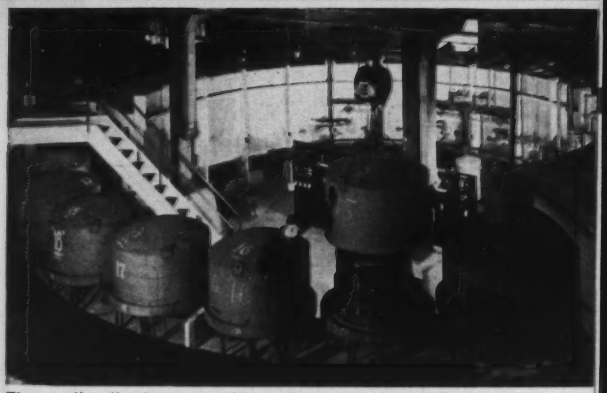
Variations within standard commercial limits of hardness for strip steels may not provide the quality needed for most critical applications.

At J&L the newest equipment and techniques are used to provide controlled hardness—to your specifications.

Basic oxygen furnaces, high standard open hearth practice and electric furnaces provide optimum melting conditions, new hot strip mills are specifically designed to produce the finishing temperatures needed for inherent quality. Cold mills, annealing and normalizing furnaces and other equipment are designed specifically for precision strip steel processing.

With an organization experienced in specialized strip steel processing, your most rigid specifications can be met consistently.

For your convenience, precision strip facilities are available to you in our plants at Youngstown, Indianapolis, Los Angeles and Kenilworth (N. J.)



The small unit rotary annealing method assures precision temperature control and develops optimum hardness and microstructure for high carbon, low carbon and alloy strip.

J&L

STRIP

LOW CARBON • HIGH CARBON • ALLOY • STAINLESS
TEMPERED SPRING STEEL • ZINC AND COPPER COATED

Jones & Laughlin Steel Corporation • STAINLESS and STRIP DIVISION • Youngstown 1, Ohio

Consumer Still Confident, But—

The U. S. consumer is still in the mood to buy, according to latest study made by Univ. of Michigan researchers.

However, many buying plans are only for "sometime in the future." Inflation and tight money cause concern.

■ How confident is the American buyer of consumer goods? And how strong is his desire to buy?

Some answers are given in the latest consumer study from the Survey Research Center of the University of Michigan. Several times a year, this group gages consumer attitudes and inclinations to buy. The latest check was made during October and November of last year. (About half the 1300 interviews were conducted while the steel strike was on, half after work resumed.)

Strength Needed — They show: The U. S. consumer is still in the mood to buy. His enthusiasm dipped during the steel strike, but it rebounded when the strike ended.

But, the survey warns, "consumer sentiment must improve considerably during the next few months if 1960 is to to be a really good year for consumer durables."

A majority of buyers have plans and desires to buy consumer goods "sometime in the future." But definite intentions to carry out spending plans within twelve months have slipped off since last June.

However, the people who are in the market are confident their income will increase. And they are growing more conditioned to installment buying. Most of their buying worries center around money and credit problems such as inflation, tight money, and rising interest rates.

Price Concern — The survey points out recent price changes have been small. However, the "opinion that prices will rise over the coming year is now nearly as common as it was during the early part of the Korean War." Since the last survey in June, more people have been convinced there will be near-term advances in the price of cars, major household goods, and clothing.

Even leaving steel strike influences aside, optimism took longer to come back from the 1958 recession than the one in 1953-54. A sharp upsurge of confidence helped demand in 1954, the survey reports. But in November, 1959, buyers' expectations were not strong enough to give a push of their own to the rising level of spending.

Compact Cars Approved—American automakers got cheering news from the survey. According to those questioned, the new U. S. compact cars are a success. More than half of the interviewees say the new cars will be popular. And favorable opinions come from all income groups.

A significant minority prefer the new compacts over the larger cars —both new and used—and over foreign cars.

Key Your Planning to Trends

■ The timing of business and consumer spending in '60 will be important in your planning.

Some buying drives will be strongest early this year. Later they may taper off. Still others will continue at a fairly steady pace.

Inventory Questions—The inventory buildup will be most robust in the first half. Sometime beyond that point it will subside. But how soon or in what degree is difficult to fix. Despite steel industry production around 95 pct of capacity, many users are still buying mainly for consumption. Efforts to build inventories are difficult. And this could delay the whole pace of inventory buildup.

Another business force — capital spending—should push ahead as the spring develops. Sizable spending plans, delayed by the steel strike, will boost the economy.

Other Forces—Consumer spending (see above) should also be a continuing influence in '60, with gains predicted over '59 levels. Another helpful factor should be foreign trade.

Wage Bargainers Had Good Year in '59

Industrial wage increases were plentiful in 1959.

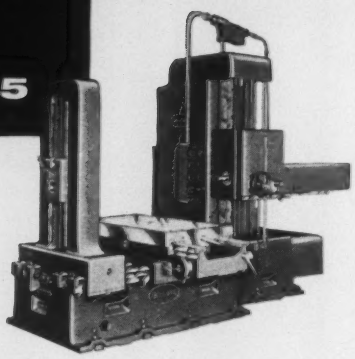
The vast majority of workers covered by collective bargaining contracts received wage-rate increases agreed to or put into effect in 1959.

Estimates from the Dept. of Labor's Bureau of Labor Statistics show seven million workers got pay increases. Of these, three million received increases during the year. Another 2¼ million got deferred increases provided by long-term contracts negotiated earlier. And 1.9 million workers got cost-of-living escalator adjustments.

GET *MORE FOR YOUR MONEY

. . . with a BULLARD

Horizontal Boring Machine • Model 75



The Gas Turbine Department of the General Electric Company, Schenectady, N.Y., recently installed a Bullard Horizontal Boring Machine, Model 75. We are confident that they got more for their money.

This "*MORE" includes: —

GREATER RIGIDITY — heavier cuts at higher speeds.

PRECISE ACCURACY — hold boring tolerances to .0005.

TABLE OUTBOARD SUPPORTS — provides work alignment even with unbalanced table load.

PENDANT CONTROL — full machine control from position most advantageous to operator.

CHROME HARDENED WAYS — on Bed and Saddle for longer wear.

BED LEVELS — built into Bed for easy checking.

FAST SERVICE — after two years of operation, little trouble, and minor complaints handled promptly.

Investigate and compare and you, too — will discover you get more for your money with a Bullard H. B. M., Model 75.

ASK YOUR BULLARD SALES ENGINEER OR WRITE FOR FULL SPECIFICATIONS TO.....

THE BULLARD COMPANY
BRIDGEPORT 9, CONNECTICUT

Will Plastics Replace Grease?

Future Cars Might Not Need Periodic Lubrication

Automakers are trying to do away with the need for lubricating parts of automobiles.

A good part of the research centers on using plastics for "dry bearings." — By A. E. Fleming.

▪ In recent years, automakers have made significant progress in cutting down on the number of lubrication points on cars. But the periodic "lube job" is still necessary—and costs just as much.

However, this is destined to become a thing of the past, at least that's the opinion of R. E. Harmon, U. S. Gasket Co. He believes that a car which doesn't need to be lubricated is a definite possibility.

How will this be achieved? "The avenue leading to the earliest practical success of a greaseless car appears to be paved with plastics," he told engineers attending the annual meeting of the Society of Automotive Engineers at Detroit.

Who Profits?—Money is the main reason for interest in doing away with the need to lubricate a car. While automakers and their customers look at it differently, they're both focusing on the same goal.

The first carmaker to perfect a car that never needs to be lubricated should cash in with higher sales.

At the same time, buyers will realize substantial savings in repair and upkeep. And safety will be improved. Not only will the expense of grease jobs be eliminated, but there should be fewer mechanical failures due to improper or negligent upkeep. At the same time, reducing chance for mechanical failures will also reduce potential accidents caused by those failures.

Beat the Heat—A car that uses no grease needs all types of bearings that need no grease—dry bearings. Metal bearings don't do the trick. Without lubrication they heat up and wear out quickly.

Mr. Harmon says recent progress with plastic bearings has been encouraging. "But it isn't realistic to believe a completely greaseless car will come all at once," he emphasizes. "Design varies a great deal from car to car. It isn't likely that engineers will agree on the first applications or on its design."

According to Mr. Harmon, the ideal bearing would perform without wear or frictional heat. It would be silent, cool and inexpensive. The ideal is still out of reach. Among plastics, Mr. Harmon lists duPont's Teflon as the best candidate for a dry bearing material. Also considered as bearing-type plastics are nylon, Teflon FEP fluorocarbon resin and duPont's Delrin.

Good Design—During the past 10 years, nylon and Teflon have been used in some dry applications against a mating surface of steel and other metals. Success was limited. In their natural bulk forms (over .030 in. thickness) nylon, Teflon and Delrin have several drawbacks. Thermal expansion is high, heat conductivity poor and load carrying

The Rover Comes Over—From England

RED ROVER, RED ROVER: The 1960 Rover "3-Litre" sedans offer conservative styling and advanced engineering "for slow obsolescence."

capacity, or compressive strength, low.

Mr. Harmon believes good engineering design principles applied to plastics can solve these problems. He says the ultimate goal of a greaseless car will be reached step by step.

Lubrication is also a subject of interest to Corvair owners and prospective owners. It concerns how to improve lubrication, not eliminate it.

Transaxle Lube Problems — According to four members of the Fuels and Lubricants Dept. of General Motors Research Laboratories, merging automatic transmissions and rear axles into single transaxle units for cars poses one of the toughest all-purpose lubrication problems. The rear-engine Corvair has a transaxle, which is a rear axle and transmission combination.

The GM researchers say they have evaluated more than 40 fluids in the past few years, trying to satisfy the simultaneous lubrication needs of both hypoid gears in the axle and clutch plates in the transmission.

They report some success. But they admit "considerable work remains to be done in matching transaxles and fluids to get best results." In the Corvair, separate transmission and gear fluids are used in models that have automatic transmissions.

No timetable has been set for coming up with the ideal transaxle fluid. But several research groups at General Motors and in the oil industry are working on it.

Atom Powered Safety

Atomic energy may never power your automobile directly. But it is certain to play an important role in the automobile of the future. Radio Active Elements will make their greatest contributions in the field of automotive safety, according to J. J. Greve and D. E. Marmer of Dow Chemical Co.'s Nuclear and Basic Research staff.

They claim the atom-powered car will probably never exist as first envisioned. The vision was that a tiny nuclear reactor would be under the hood of every car. A few grams of uranium would eliminate trips to the filling station for thousands of carefree miles.

This viewpoint is no longer popular. According to Mr. Greve and Mr. Harmer, the use of radioactivity to improve production, fueling and safety-guiding of future cars will have greater impact on the automotive future.

Safety First — They say nonpower uses of radioactivity are already making inroads into the problems of producing and maintaining auto transportation. Radioisotopes provide the most economical way to determine tool wear and, in many cases, engine wear.

But the field that offers one of the brightest potentials for real usefulness of radioactivity, say the Dow researchers, is motor vehicle safety. It is a virtually unexplored field.

Radioactivity could be used to improve the reliability and performance of mechanical parts. It could be a way to increase warning time, or lowering driver reaction time, in controlling the vehicle.

The Bull of the Woods

WOT TH' HECK DO THEY WANT WITH THAT OUTFIT IN A SHOP TODAY? DOCTORS, NURSES, AN' ALMOST A CLINIC! WE NEEDED THAT YEARS AGO WHEN YOU DAREN'T WEAR A GOATEE FER FEAR O' GITTIN' PULLED INTO A MACHINE -- NOW WITH ALL TH' SAFETY GADGETS AN' GEARS CASED, WOT DO THEY NEED WITH THAT NOW?
WELL, LUKE, THEY CAN'T LET NOTHIN' STAND STILL -- IF ONE THING GOES AHEAD YOU CAN'T LET OTHER THINGS STAY BEHIND!
THAT'S RIGHT! THIS MODERN PROGRESS JUST COMES FROM TH' OLD, OLD HABIT OF WHEN YOU GOT A NEW PAIR OF SHOES THEY DIDN'T LOOK RIGHT WITHOUT A NEW SUIT AN' HAT!
FIRE DEPT.
© 1960 by NEA Service, Inc. T.M. Reg. U.S. Pat. Off.
THE ACCESSORY

Light Heavyweights

Aluminum is being used extensively to shave the weight of six new Mack truck tractors. Mack, of Plainfield, N. J., was the nation's eighth biggest truck producer in 1959 with 17,000 units.

Mack is using aluminum and other light alloys in many parts. The result is weight reduction up to 405 lb over steel-component models. An aluminum hood is standard on two models, optional on two others. This clips 22 lb from the truck's weight.

For transport jobs where payloads are not variable, as in liquid hauling, Mack continues to offer steel-component models. But where dry freight is carried, aluminum has been used extensively. This includes the front bumper and rear spring insulator housing caps.

Quality control at Standard is second to none among the nation's major specialty product steel plants. It is maintained by the most accurate, up-to-date testing equipment available. The laboratory facilities operate around the clock to keep all vital information flowing to our metallurgists, shop foremen, mill and machine operators—as well as to plant management, and, of course, our customers.

Bring your next unusual product to us—we'll welcome the opportunity to serve you regardless of the alloy it might require. Send for the free illustrated booklet, "Quality Control at Standard."

Standard Steel Works Division

BALDWIN · LIMA · HAMILTON

BURNHAM, PENNSYLVANIA

Rings • Shafts • Car wheels • Gear blanks • Flanges • Special shapes

A long diameter and the adjacent face of drive gears are precision ground on a CINCINNATI FILMATIC Angular Wheel Slide Grinding Machine equipped with automatic sizing and flagging combined.

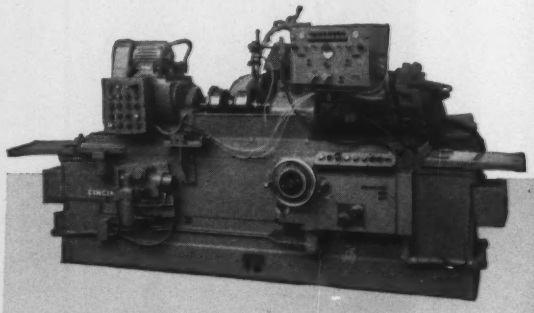
CINCINNATI GRINDING MACHINE DIVISION checks all the Angles...

to combine diameter and shoulder grinding operations profitably

Like other methods of machining, precision grinding operations often can be combined at a substantial saving in cost. Many factors must be considered, however, such as accurate wheel truing. Cincinnati Grinding Machine Division Specialists solved this problem in a unique and highly successful manner for angular wheel slide grinding.

The wheel is *automatically* trued to exact profile by merely pushing a button at front of the machine. A balanced hydraulic system assures sensitive, precise duplication of the cam contour in the wheel. Profile slide way is anti-friction; no twist; no stick-slip.

Combined diameter and shoulder grinding operations are analyzed from every angle by Cincinnati Grinding Specialists. These men have two wheelhead arrangements on which to base their recommendations—30° for diameters having a length considerably greater than the height of the shoulder, and 45° where height of shoulder equals or exceeds length of ground diameter. Complete details are in catalog G-686-1. May we send you a copy? **Grinding Machine Division, The Cincinnati Milling Machine Co., Cincinnati 9, Ohio.**



CINCINNATI FILMATIC 14"L x 36" Angular Wheel Slide Grinding Machine. These machines are also built in 6" and 10" swing sizes. Catalog No. G-686-1.

PRECISION GRINDING MACHINES: CENTERTYPE • CENTERLESS • MICRO-CENTRIC • ROLL • CHUCKING • CENTERLESS LAPPING

CINCINNATI®

GRINDING MACHINE DIVISION

Congress May Query Steel Men

Kefauver Committee Will Want to Ask Questions

The steel industry may find itself up before Congress again. This time to explain its pricing practices.

Sen. Kefauver's investigating subcommittee has been keeping its eye on the industry and even if prices don't climb, he may want to ask some questions. —By G. H. Baker.

▪ Steel may find itself explaining its prices to Sen. Estes Kefauver again before long.

The Tennessee Democrat says he and his Senate investigating subcommittee are watching steel prices "very closely."

He says he "certainly hopes" there will be no price rises. By implication, at least, he makes it clear that he will summon steel management to Washington on the double at the first sign of higher prices. But there is also a possibility that he will "invite" steel representatives to step up to the witness chair even if prices are not advanced.

Close Watch—"We are following the steel price picture very, very carefully," an investigator for the Kefauver subcommittee reports. "And one point that we're paying close attention to is the possibility that steel companies are conspiring to postpone price rises."

"Steel companies shouldn't forget," this aide continues, "that it is just as illegal to conspire not to raise price as it is to conspire to raise them. In other words, any industry-wide pricing action that's taken in concert is going to put the steel companies in trouble, as far as we are concerned. This is the case whether they conspire to raise prices, to lower them, or to keep them steady."

Unwanted Visit—Irony of this situation is that a return visit to the Kefauver committee is just what steel management has been seeking to avoid. One of the reasons for the marathon strike of 1959 was steel management's earnest desire to avoid another public grilling in Washington. Only way to avoid another such blood-letting, the companies were advised, was to avoid another price rise. And the way to avoid a price rise was to avoid increasing wages. Hence the long and bitter shut-down, which cost hundreds of millions of dollars in lost steel sales and in lost payrolls.

The strike settlement agreed to by the companies and the union may well turn out to be the most expensive ever. Not in terms of dollars, perhaps. (Administration officials are busily explaining that the settlement was "very modest," and "noninflationary.")

May Lose Face—A much more important point has been raised. If the steel companies are now to be summoned before the Kefauver committee again, they will lose again in public reputation and prestige. No businessman yet ever came away from a congressional investigating committee a winner.

Many steel officials believe they had no course except to settle on the politicians' terms.

Space Program Study Coming

▪ Congressional Democratic leaders are building their attack on the Administration's space program early.

The House Space Committee already has started a study aimed at showing the Eisenhower Administration has provided "too little funds, too little push, too little imagination" in running this country's space program. Hearings by the Committee, headed by Rep. Overton Brooks (D., La.) were scheduled to open Wednesday.

Why the Decline?—Rep. Brooks is planning a four-point thrust at the present space program. Leadoff will be a study of the "decline in the prestige of this country" as a result of Soviet achievements in space.

Second phase of the study will get into the National Aeronautics and Space Administration program —primarily plans for the coming fiscal year. This will be followed by a detailed study of military space and missile programs. The probe will wind up with testimony beginning about Feb. 19 from civilian and industry witnesses.

Two More—In addition to the Brooks inquiry, Sen. Lyndon Johnson (D., Tex.) majority leader of the Senate, says the Senate Space Committee, which he heads, and the Senate Armed Services Committee will also go through a similar probe sometime this year.

The Administration is certain to catch it from the congressional committees. Democratic political strategists have made it clear that they will make the alleged "fiscal straitjacket" placed on space and missile development by the President a prime issue in election campaigns.

For FASTER CUT-OFF SAWING at the LOWEST COST-PER-CUT

the

ALL NEW

Milband

BAND SAW MACHINE TOOL

- FAST CUTTING WITH EXTREME ACCURACY
- NARROWER KERF MEANS REDUCED CHIP LOSS
- MINIMUM BLADE STRESS, MUCH LONGER BLADE LIFE
- CUTS ARE CONSISTENTLY STRAIGHT, SMOOTH, ACCURATE

ADVANCED DESIGN

- RUGGED CONSTRUCTION WITH RIGID, OVERSIZED BLADE WHEELS
- FULLY AUTOMATIC OPERATION
- WIDE RANGE OF INFINITELY VARIABLE BLADE SPEEDS
- CONVENIENT, CENTRALIZED CONTROLS
- FAST-ACTING HYDRAULIC VISE
- RECIRCULATING COOLANT SYSTEM

The Blade Behind the Machine

... is the MILFORD REZISTOR High Speed Steel Band Saw Blade. Ideal team-mate for the MILBAND Machine Tool, this blade is made from red-hardness steel, outlasts ordinary carbon steel blades many times, and production-saws stainless steel and other tough alloys these blades cannot cut.

SPECIFICATIONS

Blade Speed Range	40 to 360 fpm, infinitely variable
Blade Feed	hydraulic, with compensating flow for work section variations
Motor	3 hp drip-proof with oil-tight push button controls
Blade Guides	carbide, individually adjustable
Blade Tensioning	hydraulic, with tension maintained automatically
Work Receiving Table	25½" x 26½"
Machine Dimensions:	
Width, Including Vise Guard	43½"
Length	93"
Height, Head Down	55"
Height, Head Raised	65"
Bar Feed Dimensions:	
Width, Including Vise	49½"
Length	73"
Weight of Machine and Bar Feed	3000 pounds
Blade Type and Size	MILFORD REZISTOR High Speed Steel Band Saw Blade, 1" x 15'

SAW & BAND SAW BLADES • HACK • HOLE SAWS • GROUND FLAT • STOCK

MILFORD

WRITE NOW FOR DESCRIPTIVE LITERATURE

Saw Specialists For Over 80 Years

The HENRY G. THOMPSON & SON CO.

MACHINE TOOL DIVISION • 278 CHAPEL ST., NEW HAVEN 5, CONNECTICUT

DIRECT REPRESENTATIVES AND DISTRIBUTORS IN PRINCIPAL CITIES

West Fabricators Have Problems

Changes Coming This Year Could Help

Reinforcing bar fabricating is an $85 million business on the West Coast.

But the industry has some tough problems. And changes are due.—By R. R. Kay.

■ Changes are coming in the West Coast's reinforcing steel industry.

Right now the area is fabricating reinforcing bars at the rate of $85 million a year. But over-capacity is a problem. And the industry has some problems.

What to Expect—You'll see some important changes during the year. Here are some of the trends to watch:

Smaller fabricators are buying more foreign steel. It's 20 to 25 pct cheaper. They claim it's one of the ways they can offset the competition of the mill-fabricator.

Smaller fabricators may sell their plants to mills.

Big mill-fabricators will push harder their best weapon against import steel: Fast delivery and service, and a wider choice of stock.

Some bar mills may go into the fabricating business.

Larger, well-financed operators might build their own mills. Two already have: Soule Steel, Los Angeles, and Yuba Consolidated Industries, Tempe, Ariz.

The Import Bite — Farwestern mills can turn out 800,000 tons of reinforcing steel per year. Rebar use is high in the region. And it's growing steadily with Farwestern expansion. Yet only 600,000 tons are used up.

Of this, 100,000 tons comes from foreign mills—17 pct of the total.

California's "Buy American" Act may be one answer to the import tide. The law says that public works projects may not use foreign materials. So far, it's a fairly effective block.

To Mars and Back?

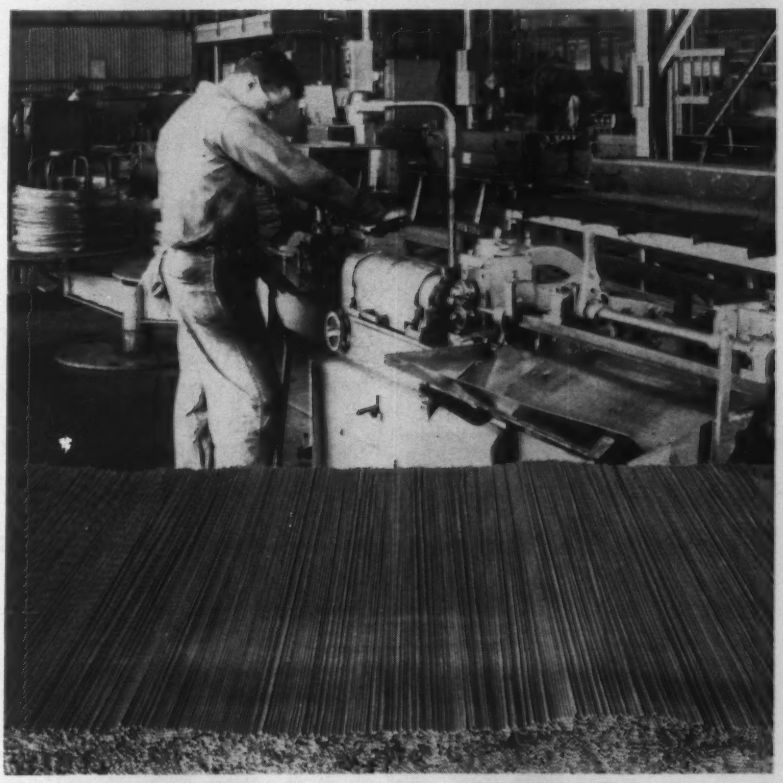
A trip to Mars and a safe voyage home is possible within ten years. Round trip time: 14 months.

That's not a headline catching boast. After years of research, Douglas Aircraft experts say it's feasible in a nuclear space craft.

Ryan Buys Aerolab

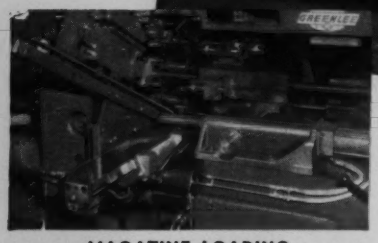
Ryan Aeronautical Co., San Diego, has acquired Aerolab Development Co. of Pasadena, Calif. Aerolab specializes in aerophysics research. Under the new arrangement the company will continue operations at Pasadena as a wholly owned Ryan subsidiary.

Bronze Welding Rod from the Farwest

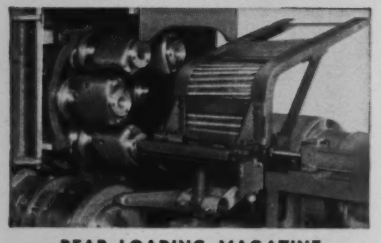


READY FOR MARKET: Bronze welding rod, made by Titan Metal Mfg. Co., Newark, Calif., is stamped, straightened, and cut to length in Patterson straightener. Titan is believed to be the first manufacturer in the Farwest to produce a complete line of bronze welding rod.

Second Operation



MAGAZINE LOADING



REAR LOADING MAGAZINE

HAND LOADING

A Method of Machining That Pays Off

Greenlee standard Automatic Bar Machines, adapted for second operation work, profitably machine a wide variety of parts. Long shafts or short pieces are automatically loaded into the work spindle by any of the various loading arrangements shown. Parts are loaded in one position during the machining cycle, and machined in the remaining five cross slide and end working positions. For more information, see your Greenlee Distributor.

GREENLEE STANDARD AND SPECIAL MACHINE TOOLS

- Multiple-Spindle Drilling and Tapping Machines
- Transfer-Type Processing Machines
- Die Casting Machines
- Six and Four-Spindle Automatic Bar Machines
- Hydro-Borer Precision Boring Machines

WRITE FOR CATALOG No. A-405

GREENLEE BROS. & CO.

1744 MASON AVE.
ROCKFORD, ILL.

More Aluminum Engines Coming

Early Tools Will Serve Dual Purpose in Manufacture

Passenger car makers are pushing to beat each other in the race for more aluminum engines.

Early machines will be able to handle cast iron and aluminum, but will speed production.—By R. H. Eshelman.

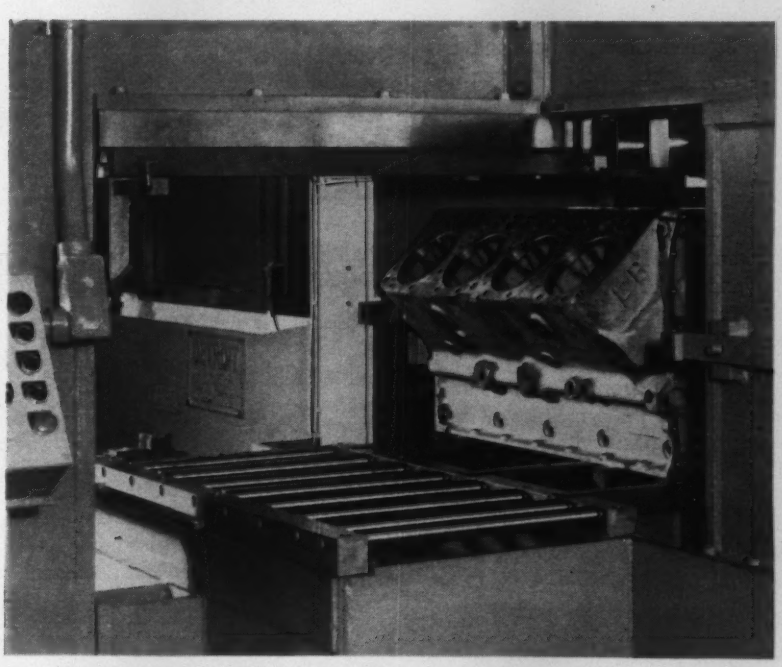
■ The aluminum engine is one of the prime topics of conversation as automotive engineers gather in Detroit for the annual SAE meeting. Passenger car manufacturers are jockeying for position to see who gets to the wire next.

Already industry sources report expansion plans afoot for boosting Corvair aluminum engine production. Inside sources say the multi-million dollar program may run as high as $5 million for additional equipment in the 1960's.

Dual Purpose — Early machines are likely to follow the trend to dual-purpose, handling either cast iron or aluminum. Good example of this is a special broach recently shipped to a major diesel engine producer by Detroit Broach & Machine Company, Rochester, Mich.

It's designed to broach bearing cap contact faces on four or six cylinder in-line blocks and also V-8 blocks. It will handle either cast iron or aluminum parts by means of adjustable cutting speeds of four to 45 feet per minute. The stroke is also variable—from six to 80 in.

Wide Flexibility—This unit has a number of interesting features that give it a wide range of production flexibility. The workholding arrangement is such that the unit can be operated independently or in a fully automated setup.



BROACHING MACHINE: Diagonal side view of machine with cylinder block in broaching position. Machine was built by Detroit Broach & Machine Co.

A patented Oilgear circuit is said to positively control maximum temperature rise under normal operating conditions. This would be especially desirable in broaching aluminum blocks. The system holds temperature of hydraulic fluid below 120°F. Also, there's automatic lubrication to critical areas, build-in provisions for coolant, and the variable speed controls for dual operation.

Fully Automatic — With either manual loading or in-line operation, the machine is fully automatic once the operator punches the start button. When the block is in loading position, the fixture loader hydraulically shuttles it into broaching position against a fixed (but adjustable) stop.

Locating pins elevate into block locating holes to check accurate alignment of the workpiece automatically. The block is clamped down from the head surface, then a thrust block actuates to engage the rear end of the part of the crankbore.

When this happens, a limit switch starts the broaching cycle. At the end of the ram stroke, the part unclamps, locating pins retract and the block shuttles out for unloading. Estimated speed of the entire operation (floor-to-floor time) is under 40 seconds.

INDUSTRIAL BRIEFS

Converters Ordered — Pintsch Bamag A. G. of West Germany has a contract for two 100-ton capacity oxygen steel converters and ladle cars by the H. K. Ferguson Co., Div. of Morris-Knudson Co., Inc. The converters will be erected at the Pueblo Steel Mill of Colorado Fuel & Iron Co. Erection and operation is scheduled for the end of 1960.

In Detroit—J. O. Ross Engineering Div., Midland-Ross Corp. is building new offices in Detroit. The new building is located at 13050 Puritan Ave. It will house engineering and office personnel of Ross, plus representatives of the Midland-Ross Corp.

Summer School—The 1960 summer institute on principles of nondestructive testing will be held Aug. 15-26, at Sacramento State College. For details contact: G. N. Beaumariage Jr., Engineering Dept., Sacramento State College, Sacramento 19, Calif.

Texas Plant — Susquehanna-Western, Inc., a subsidiary of The Susquehanna Corp., Chicago, plans a new uranium ore processing plant. It will be constructed near Falls City, Texas, at an estimated cost of $2.5 million.

The Biggest—Pittsburgh Metallurgical Co., Inc. has let contracts for another electric arc furnace at its Calvert City, Ky., plant. The new furnace will be the largest of the company facilities and will be housed in a separate building. It is scheduled to be operating by mid-year, 1960.

Mississippi Riverboat — Ingalls Shipbuilding Corp. has a contract by the Army Corps of Engineers to build a $1.4 million diesel-powered towboat to be used on the lower Mississippi River. To be built at Ingalls' Pascagoula, Miss., shipyards, the new Mississippi will be able to tow 15,000 gross tons at 8 miles an hour in still water.

Triple Threat—The Lead Industries Assn. has elected Jean Vuillequez, as president, chairman of the board, and chairman of the executive committee. Mr. Vuillequez is vice president of American Metal Climax, Inc. He has been a member of the board of directors of the Association since 1953.

Merger OK'd—Stockholders of Arwood Precision Casting Corp. have approved a merger with Mercast Mfg. Corp. and Alloy Precision Castings Co., to form a new company, the Arwood Corp. The new company can supply castings ranging from a fraction of an ounce to a hundred lbs or more, using investment, shell, and frozen mercury processes.

Getting Together—The Merger of Bell & Howell Co. and Consolidated Electrodynamics Corp. has been approved. Under the merger, CEC, a Pasadena electronics firm, will become a subsidiary of Bell & Howell, Chicago photographic equipment manufacturers. CEC will operate under its present name with present management and personnel.

New V. P.—R. E. Waindle, president of Wai Met Alloys Co., Dearborn, Mich., has been named by the Investment Casting Institute to the newly created position of vice president—Technical Division.

"College grad, eh. Show me your sheepskin."

Diversified Department—Jones & Lamson Machine Co., Springfield, Vt. manufacturer of machine tools and optical inspection equipment, has created a Marketing Services Dept. The new department will be responsible for marketing research, advertising, sales promotion and training and national news and public relations.

In Agreement—The Electronics & Instrumentation Div. of Baldwin-Lima - Hamilton Corp., Waltham, Mass., and High Temperature Instruments Corp., Bala-Cynwyd, Pa., have a new licensing and marketing agreement between them. The arrangement gives B-L-H rights to the high temperature cements and products developed and handled by H.T.I. Corp.

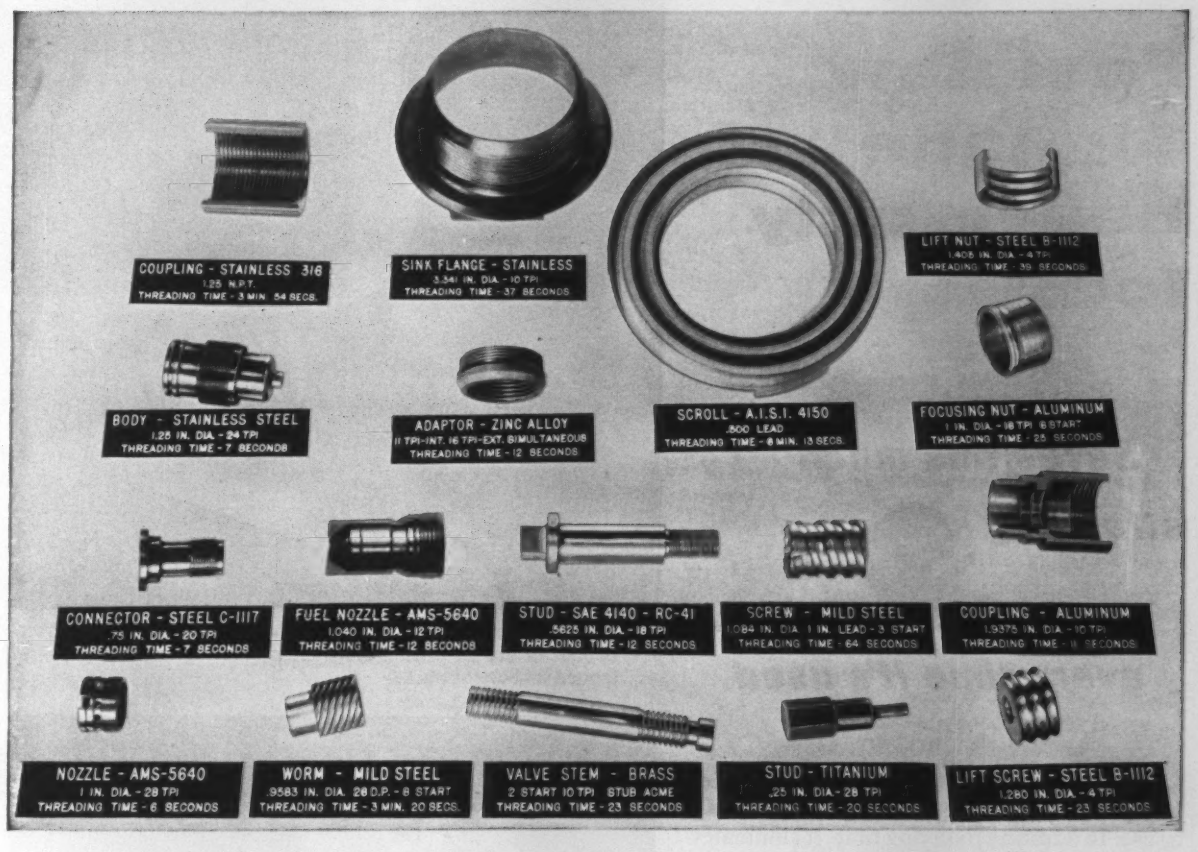
Safety First—Abrams Metal Co., Philadelphia, has been awarded first place in a national safety contest sponsored by the Institute of Scrap Iron & Steel Inc. The company had no injuries during the period of the contest—Jan. 1, 1959 to Oct. 31, 1959.

Finished Plans — Detroit Gray Iron & Steel Foundries, Inc. have completed plans for the construction of its new Shaw Process Div. Operating under a license from the Shaw Process Div. of British Industries Corp., Detroit will manufacture precision iron and steel dies and castings.

Hardinge to Expand—Hardinge Mfg. Co., subsidiary of Hardinge Co., Inc., York, Pa., will spend $300,000 to expand and modernize its foundry facilities. The enlarged foundry will include the latest in core ovens, sand mixing apparatus, cranes, and other materials handling equipment.

All About Casting—A color and sound film, "Cast Metals and You," has been released by the Education Div. of the American Foundrymen's Society. The new film depicts the role of metal castings in the world today. Requests for bookings of the film should be directed to AFS, Golf & Wolf Rds., Des Plaines, Ill.

Start saving money right now on threading jobs like these with...


COUPLING - STAINLESS 316
1.25 N.P.T.
THREADING TIME - 3 MIN. 54 SECS.
SINK FLANGE - STAINLESS
3.341 IN. DIA. - 10 TPI
THREADING TIME - 37 SECONDS
LIFT NUT - STEEL B-1112
1.405 IN. DIA. - 4 TPI
THREADING TIME - 39 SECONDS
BODY - STAINLESS STEEL
1.25 IN. DIA. - 24 TPI
THREADING TIME - 7 SECONDS
ADAPTOR - ZINC ALLOY
11 TPI-INT. 16 TPI-EXT. SIMULTANEOUS
THREADING TIME - 12 SECONDS
SCROLL - A.I.S.I. 4150
.500 LEAD
THREADING TIME - 8 MIN. 13 SECS.
FOCUSING NUT - ALUMINUM
1 IN. DIA. - 18 TPI (6 START)
THREADING TIME - 25 SECONDS
CONNECTOR - STEEL C-1117
.75 IN. DIA. - 20 TPI
THREADING TIME - 7 SECONDS
FUEL NOZZLE - AMS-5640
1.040 IN. DIA. - 12 TPI
THREADING TIME - 12 SECONDS
STUD - SAE 4140 - RC-41
.5625 IN. DIA. - 18 TPI
THREADING TIME - 12 SECONDS
SCREW - MILD STEEL
1.084 IN. DIA. 1 IN. LEAD - 3 START
THREADING TIME - 64 SECONDS
COUPLING - ALUMINUM
1.9375 IN. DIA. - 10 TPI
THREADING TIME - 11 SECONDS
NOZZLE - AMS-5640
1 IN. DIA. - 28 TPI
THREADING TIME - 6 SECONDS
WORM - MILD STEEL
.9583 IN. DIA. 28 D.P. - 8 START
THREADING TIME - 3 MIN. 20 SECS.
VALVE STEM - BRASS
2 START 10 TPI STUB ACME
THREADING TIME - 23 SECONDS
STUD - TITANIUM
.25 IN. DIA. - 28 TPI
THREADING TIME - 20 SECONDS
LIFT SCREW - STEEL B-1112
1.280 IN. DIA. - 4 TPI
THREADING TIME - 23 SECONDS

CRI-DAN SINGLE-POINT THREADING LATHES

...cut costs with simple single-point carbide tools. They're easily resharpened or replaced. They eliminate expensive upkeep of thread milling cutters or thread grinding wheels.

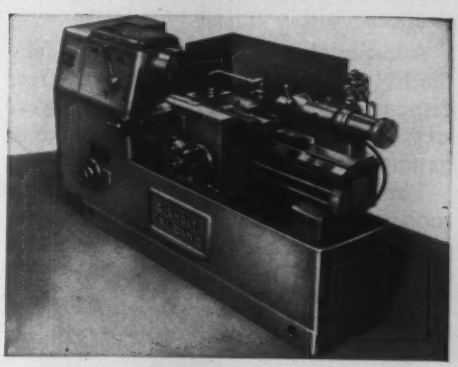
...assure extremely accurate lead and thread form and exceptional finish with low-cost carbide tools on materials that don't allow economical threading by other methods.

...handle any material from titanium or toughest alloy steels to brass and other non-ferrous metals with a wide selection of spindle speeds and feeds to meet all job requirements.

...set up fast to produce single- or multiple-start, coarse or fine, left- or right-hand threads, parallel or tapered with metric or inch pitches—thread up to shoulders on all types of internal and external operations.

...cut costs from start to finish with CRI-DAN's speed, versatility and economy.

Why put off the savings the CRI-DAN method can bring you *right now*? Ask your Gisholt Representative for complete details. Or write us for literature or cost estimates on your particular work.



Two models are available. The smaller Model B (shown) offers extreme flexibility with spindle speeds of from 154 to 2808 r.p.m.; 3′ capacity between centers and 15½″ swing over bed. Rugged saddle supports fast-acting threading slide, easily positioned along bed. Complete change-over from job to job can be made in 15 minutes.

GISHOLT MACHINE COMPANY
Madison 10, Wisconsin

Investigate Gisholt's Extended Payment and Leasing Plans

Turret Lathes • Automatic Lathes • Balancers • Superfinishers • Threading Lathes • *Factory-Rebuilt Machines with New-Machine Guarantee*

Fast new Signode heavy-duty tool

at least
Saves this much strapping

every time it's used

The FN-114 is the first air power feed wheel heavy-duty tensioning tool. It is fast and easy to use. In addition to saving time, it eliminates waste in the curl of strap which, until now, has been a necessary evil in applying 1¼-inch strapping with windlass type tools.

Additional savings come from the fact that the FN-114 takes strapping directly from the dispenser—takes out all the slack *before* the strapping is cut off by a quick stroke of the handle.

The FN-114—like other Signode heavy-duty tools—is available on an annual rental or single payment basis. Let us arrange a demonstration on your premises at your convenience. Just write or call. No obligation.

Air power tensions 1¼" strapping fast, pulls as much as 3000 pounds of pre-set tension every time. Feed wheel permits unlimited take-up of slack.

The powerful FN-114 holds the tension in the strapping while the operator applies the seal, using a Signode Model C tool. Signode heavy duty air-powered sealers are also available.

New 1¼" seal has open flange to permit fast, easy placement. This seal or regular thread-on seal can be lithographed with your company name, trademark, and colors.

First in steel strapping

SIGNODE STEEL STRAPPING CO.

2623 N. Western Avenue, Chicago 47, Illinois

Offices Coast to Coast. Foreign Subsidiaries and Distributors World-Wide
In Canada: Canadian Steel Strapping Co., Ltd., Montreal • Toronto

H. J. Wallace, appointed president, National Tube Div., U. S. Steel Corp., Pittsburgh.

U. S. Steel Corp., Oliver Iron Mining Div.—**C. F. Beukema,** appointed president.

Pittsburgh Coke & Chemical Co. —**H. R. Mustard,** elected vice president, finance.

Stanley-Humason, Inc. — **L. S. Whitney, Jr.,** elected president and a director.

Rosedale Foundry & Machine Co.—**D. H. Ambrose,** elected a vice president; **P. H. Magnus, II,** elected executive vice president.

Arwood Corp.—**W. I. Matthes,** named president; **R. L. Wood,** elected chairman of the board; **W. O. Sweeny,** elected executive vice president.

Jones & Laughlin Steel Corp., Pittsburgh Works Div. — **H. I. Smith,** appointed superintendent, Rolling Mills Dept.; **R. C. Ehrhardt,** named asst. superintendent.

The Carpenter Steel Co.—**J. W. Lynch,** appointed manager, sales, special products, Reading, Pa.; **F. R. Mitchell, Jr.,** appointed branch manager, New York and Bridgeport, Conn.

Alan Wood Steel Co.—**R. W. Tollman,** named manager, systems.

Lindberg Engineering Co.—**H. A. Moffat,** appointed salt bath furnace specialist.

Republic Steel Corp. — **W. E. Schnitgen,** named superintendent, Hot Strip Finishing Dept., Warren, O., steel plant; **H. O. Ripple,** appointed superintendent, Steel Conservation and Quality Dept.

Jones & Lamson Machine Co.— **J. D. Wood,** named manager, Marketing Services Dept., Springfield, Vt.

Aluminum Co. of America, Commercial Research Div.—**R. K. Smith, Jr.,** named manager, and **G. V. B. Day,** named asst. manager.

E. G. Price, appointed executive vice president, National Tube Div., U. S. Steel Corp., Pittsburgh.

The Youngstown Sheet & Tube Co.—**J. P. DeHetre,** named general manager, sales.

Consolidated Electrodynamics Corp., Electro Mechanical Instrument Div.—**E. P. Fleischer,** appointed asst. director.

The Garlock Packing Co.—**G. P. Wiess,** appointed product manager, Gasketing product line.

Republic Steel Corp. — **H. F. Burttram,** appointed asst. superin-

(Continued on P. 72)

A. J. Fisher, Jr., elected executive vice president, Metal & Thermit Corp., New York.

G. B. Margraf, elected a vice president, Reynolds Metals Co., Richmond, Va.

G. H. Glasier, appointed executive vice president, Air Reduction Sales Co., New York.

STRAITS TIN REPORT

News of developments in the production and uses of tin

MALAYAN TIN BUREAU

Nontoxic, inert, malleable – all three are descriptive of tin. One of man's oldest metals, it is still vital in our modern economy. For example –

For product protection, 60.7% of all tin consumed in the U.S. is used in manufacturing tinplate, largely for containers. 135 industries package a total of over 2500 products in more than 42 billion cans annually!

For joining and sealing, 14.8% of all tin used is in alloy with lead to form solder.

For strength and corrosion resistance, 6.5% is consumed in the tin-copper alloy, bronze.

For anti-friction properties, 4.1% is consumed in the high-tin/lead alloy, babbitt, generic for bearing metals.

For protective coatings, tinning accounts for 3.9%. Hot-dipped tin provides a smooth, reflecting surface, particularly adaptable for food processing equipment.

For castability, white metal – alloys of tin, antimony, lead, bismuth, and copper – account for 3.2% of U.S. tin consumption.

Miscellaneous alloys use 4.2%; chemicals, 1.1%; and collapsible tubes, 1.5%.

There's no substitute for tin . . . and no substitute for Straits Tin from Malaya – recognized standard for quality and uniformity, available in reliable supply from sizeable reserves.

Write today for more data on these items or for a free subscription to TIN NEWS—a monthly bulletin on tin supply, prices and new uses.

The Malayan Tin Bureau
Dept. 54-A, 2000 K Street, N.W., Washington 6, D.C.

(Continued from P. 71)

tendent, blooming mill, Gadsden, Ala., plant.

Bridgeport Brass Co. — **K. M. MacQuarrie,** appointed manager, Warren, O., plant.

J. W. Nall, elected a vice president, The Lamson & Sessions Co.

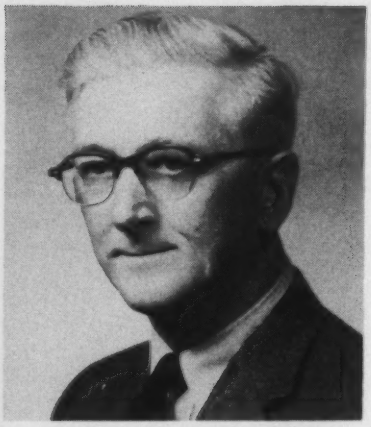
Latrobe Steel Co.—**G. E. McDonald,** named general counsel.

United Air Lines — **W. O. Buehler,** appointed superintendent, purchase contracts.

Buffalo Forge Co.—**G. H. Johnson, Jr.,** appointed Buffalo district sales manager.

Kaiser Steel Corp., Sales Div.—**F. G. Brear,** appointed manager, customer service; **W. M. Vaughey,** appointed manager, administration, general sales.

Paul Duke, elected vice president and director, L. B. Foster Co.



W. H. McCormick, appointed assistant director, metallurgy, Crucible Steel Co. of America.

The Falk Corp.—**D. K. Lambert,** appointed manager, export sales.

H. K. Porter Co., Inc—**C. P. Stewart,** appointed manager, trade relations.

Westinghouse Electric Corp., Portable Appliance Div. — **O. L. Taylor,** appointed engineering manager and **C. W. Paulson,** marketing manager, Mansfield, O., plant.

L. W. Jander, promoted to general sales manager, Yale Materials Handling Div., The Yale & Towne Mfg. Co., Philadelphia.

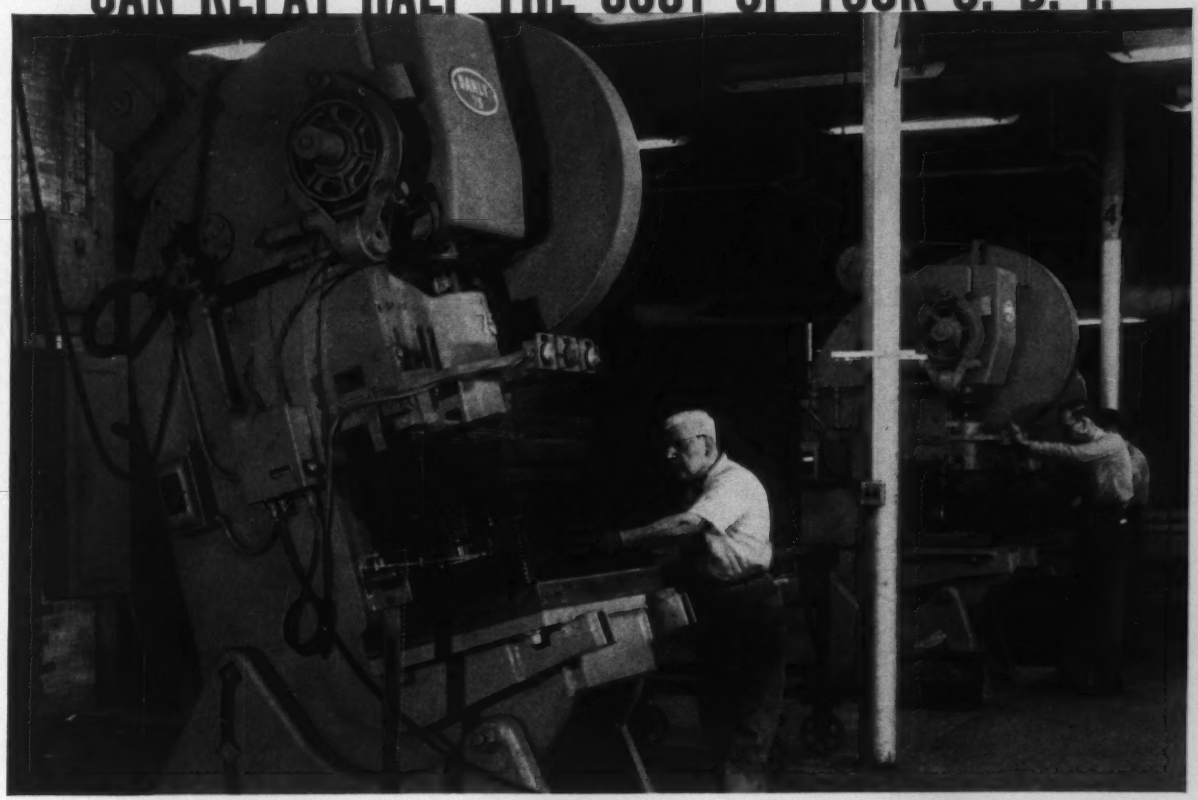
Stewart-Warner Corp., Alemite and Instrument Div.—**L. L. Robb,** appointed asst. general manager.

General Motors Corp., Hyatt Bearings Div.—**J. H. Gebo,** appointed asst. chief engineer—auto-

(Continued on P. 76)

LESS FRAME DEFLECTION

CAN REPAY HALF THE COST OF YOUR O. B. I.

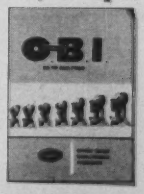


Is die life important on an O.B.I.? It certainly is! Die investment usually adds up to several times the cost of a press. Savings from just 15% or 20% improvement in die life is frequently enough to repay half your press cost.

This is why Danly O.B.I.s are built stronger, sturdier, to the industry's highest standards of rigidity. Danly O.B.I.s give you less frame deflection . . . more accurate die closure . . . longer die life . . . real savings in tooling costs! And other years-ahead design features, like Danly's exclusive low inertia air friction clutch, assure you of less downtime, lower maintenance costs, more dependable production.

Danly O.B.I. and gap frame presses have been setting remarkable performance records in the nation's largest press rooms for many years. Now this same Danly custom quality is available in a complete, standardized O.B.I. line, in capacities from 25 to 200 tons.

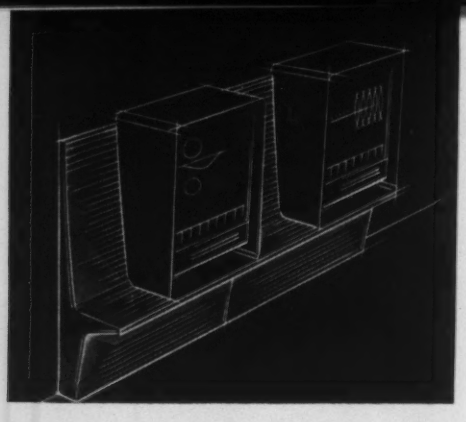
NEW CATALOG. For specifications and more facts, write today for your copy of the new Danly O.B.I. Press Catalog.



DANLY

DANLY

DANLY MACHINE SPECIALTIES, INC., 2100 S. Laramie Ave., Chicago 50, Ill.



SHARONART*

a new idea in steel . . . sparks a new idea in

Famed designer Peter Schladermundt creates new machine concept using New Sharon Steel.

Vending machines can now stay brighter, newer, longer . . . thanks to amazing new Sharonart*.

Believing few machines are subject to the abuse received daily by the vending machine, nationally famous designer Peter Schladermundt recognized the many advantages Sharonart* would impart to this hard working equipment.

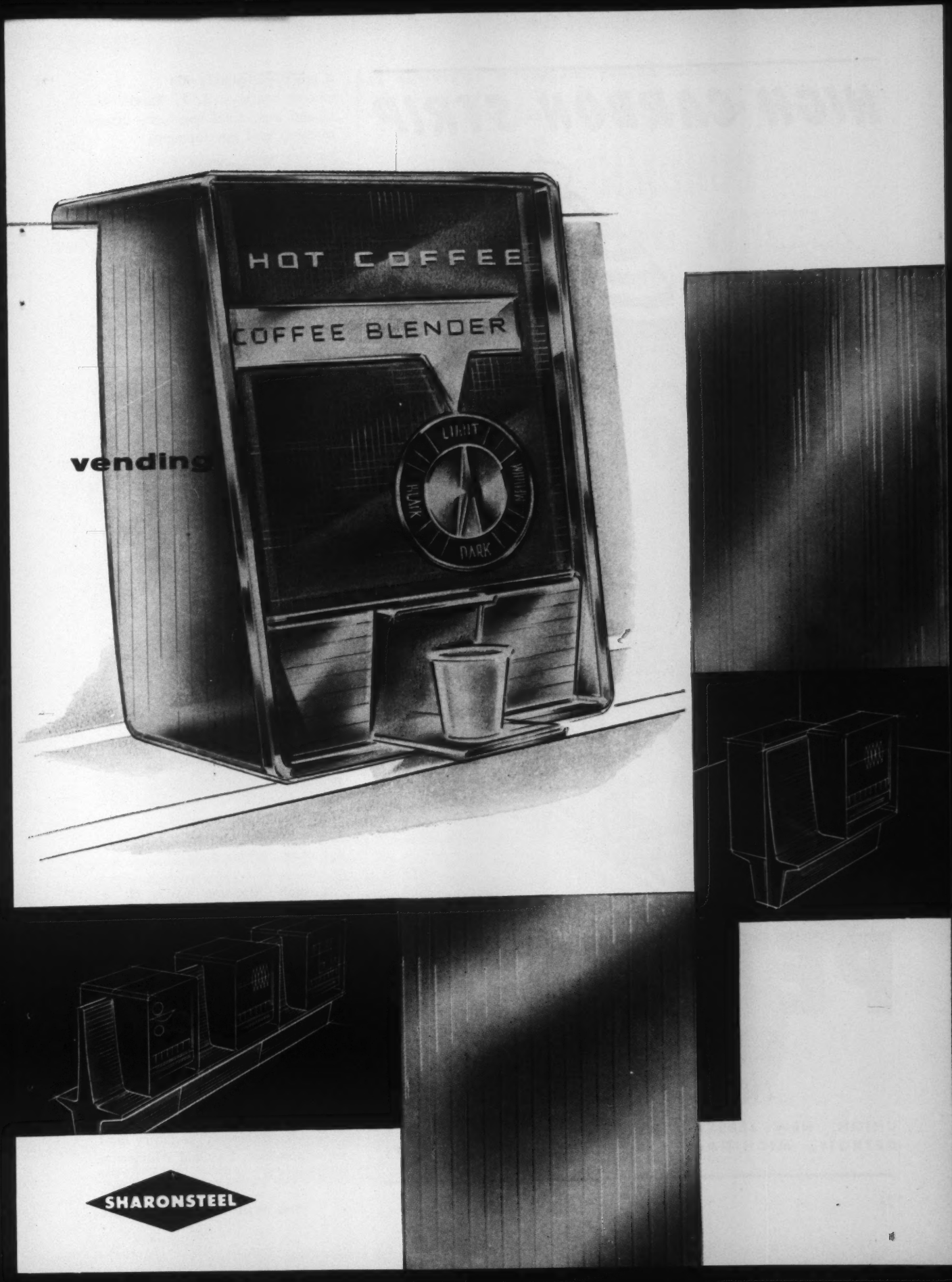
Sharonart* is patterned steel at its finest . . . and the many pattern combinations present a new plateau for the machine designer. He can now make model changes simply by altering steel patterns. But more important, Sharonart* resists marking and now vending machines will be able to absorb much more punishment without losing their attractiveness. Too, with modern painting techniques, manufacturers are able to achieve smart, new color combinations to give their product even greater beauty and sales appeal.

Wherever functional beauty and long life are desired, Sharonart* is the one perfect metal. For additional information write Sharonart, *Sharon Steel Corporation, Sharon, Pa.*

Aside from designing the vending machine of Sharonart, Peter Schladermundt has created an entire new process of machine vending. By developing special racks, machines can be easily added and removed according to demand, and/or for refilling. Rack could be made as a fixed wall type, or as an island, with machines operated from both sides. Machines could be hung individually or doubly, saddle style.*

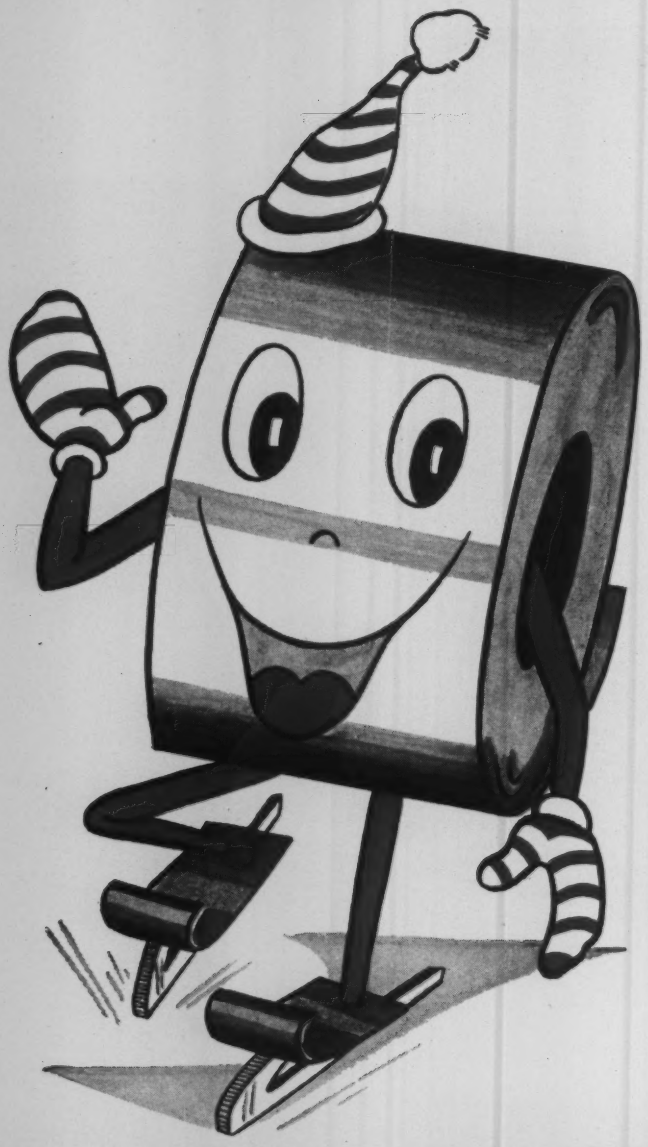
Note: The vending machine idea illustrated on these pages is not now a manufactured product. It is a design only. *TM

SHARON *Quality* **STEEL**



SHARONSTEEL

HIGH CARBON STRIP



PETERSON

STEELS, INC.

THE 52100 HOUSE

UNION, NEW JERSEY · WETHERSFIELD, CONNECTICUT
DETROIT, MICHIGAN · MELROSE PARK, ILLINOIS

(Continued from P. 72)

motive bearings; **J. F. Moult, Jr.,** named asst. chief engineer—design research and development.

E. N. Robinson, appointed general manager, Alemite and Instrument Div., Stewart-Warner Corp., Chicago.

W. F. Martin, appointed director, manufacturing services, Borg-Warner Corp., Chicago.

Gisholt Machine Co. — **H. J. Holm,** appointed secretary.

Associated Spring Corp., Wallace Barnes Div.—**J. W. Wells,** appointed chief product engineer, and **R. E. Brault,** appointed chief industrial engineer, Bristol, Conn.

OBITUARIES

Otto Haas, founder and chief executive, Rohm & Haas Co., Philadelphia.

G. H. Hammon, secretary and superintendent, Fairfield Aluminum Castings Co.

RIGHT . . . in every shape and size

for fast action and long life

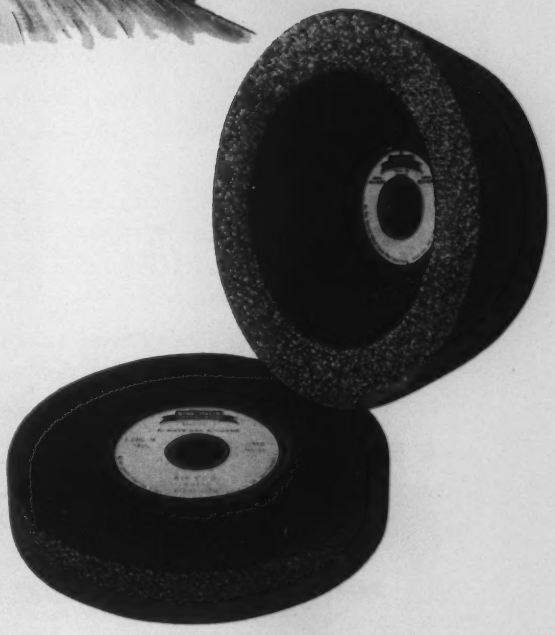
SIMONDS SNAGGING WHEELS

FOR PORTABLE GRINDERS

Right for you . . . for rapid metal removal and long wheel life. With Simonds snagging wheels, that is *consistently* true, from order to order. They're made for all portable grinders . . . air, electric or flexible shaft . . . straight wheels, cup wheels, cones and depressed center wheels. Resinoid bonded for high speeds up to 9,500 s.f.p.m. Vitrified bonded for regular or low speeds up to 6,500 s.f.p.m.

Improved resinoid bond contains an internal lubricant consisting of special chemicals and compounds added to the wheel mix for improved grinding action.

Write for Bulletin ESA-304

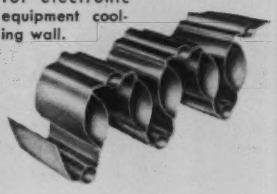


SIMONDS ABRASIVE CO.

PHILADELPHIA 37, PENNA.

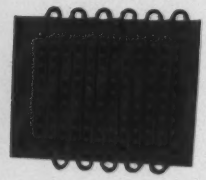
COUNT ON / YOUR SIMONDS DISTRIBUTOR FAST SERVICE • LOCAL STOCKS

WEST COAST PLANT: EL MONTE, CALIF. — BRANCHES: CHICAGO • DETROIT • LOS ANGELES • PHILADELPHIA • PORTLAND, ORE. • SAN FRANCISCO SHREVEPORT — IN CANADA: GRINDING WHEELS DIVISION, SIMONDS CANADA SAW CO., LTD., BROCKVILLE, ONTARIO • ABRASIVE PLANT, ARVIDA, QUEBEC

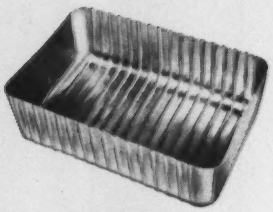


Section of Aluminum Tube-In-Strip combining refrigerant passages with air cooling for electronic equipment cooling wall.

Copper Tube-In-Strip used as a combustion chamber for water heater.



Copper Tube-In-Strip with return bends attached to produce a cooling plate.



This electronic cooling case of Revere Aluminum Tube-In-Strip was inflated after drawing.

REVERE *Tube-In-Strip* SCORES

NOW USED AS WATER-COOLED BUS BAR in manufacture of General Electric Semiconductor Rectifiers

HAS THESE 4 BIG MONEY-SAVING ADVANTAGES

1 Because it is a homogeneous mass Revere Tube-In-Strip eliminates the possibility of leaks.

2 User is able to obtain more efficient cooling.

3 If user finds it necessary to change cells it can be done without draining the system.

4 Revere Tube-In-Strip enables user to have a completely sealed system, thus eliminating O-rings or gaskets.

The use, by General Electric, of Revere Tube-In-Strip as water-cooled bus bar is still another of the myriads of ways this revolutionary product can be applied in industry.

The unique thing about Revere Tube-In-Strip is that it is a solid piece of metal, not two strips welded, brazed or bonded together. You buy strip, fabricate it as you wish, stamping, bending or forming it, and then as a final operation inflation expands the integral channels into tubes. Expanding in the open, the tubes are round; by expanding into dies, the tubes can be made rectangular, fluted, half-round, hexagonal, etc.

Revere Tube-In-Strip saves on first cost, and in fabrication. New and improved designs are made possible. The web between the tubes conducts heat faster. The vastly increased structural strength means you can use lighter gauges, saving in weight and price.

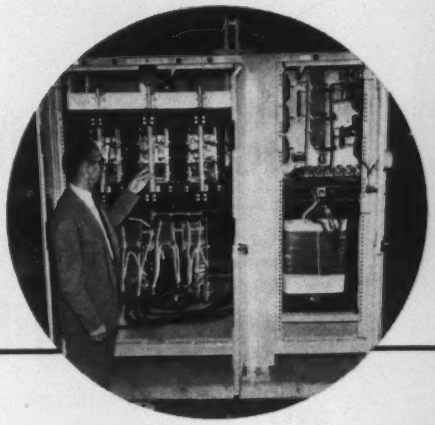
Revere Tube-In-Strip is available in Copper, Copper-base alloys and Aluminum alloys. The Revere Technical Advisory Service and the Research and Development Department will gladly collaborate with you in taking full advantage of this marvelous new material.

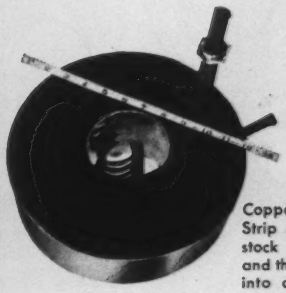
REVERE COPPER AND BRASS INCORPORATED

Founded by Paul Revere in 1801
230 Park Avenue, New York 17, N. Y.

Mills: Rome, N. Y.; Baltimore, Md.; Chicago, Clinton and Joliet, Ill.; Detroit, Mich.; Los Angeles and Riverside, Calif.; New Bedford, Mass.; Brooklyn, N. Y.; Newport, Ark.; Ft. Calhoun, Neb. Sales Offices in Principal Cities, Distributors Everywhere.

Copper Tube-In-Strip spiral containing both water and refrigerant passages for increased cooling efficiency.



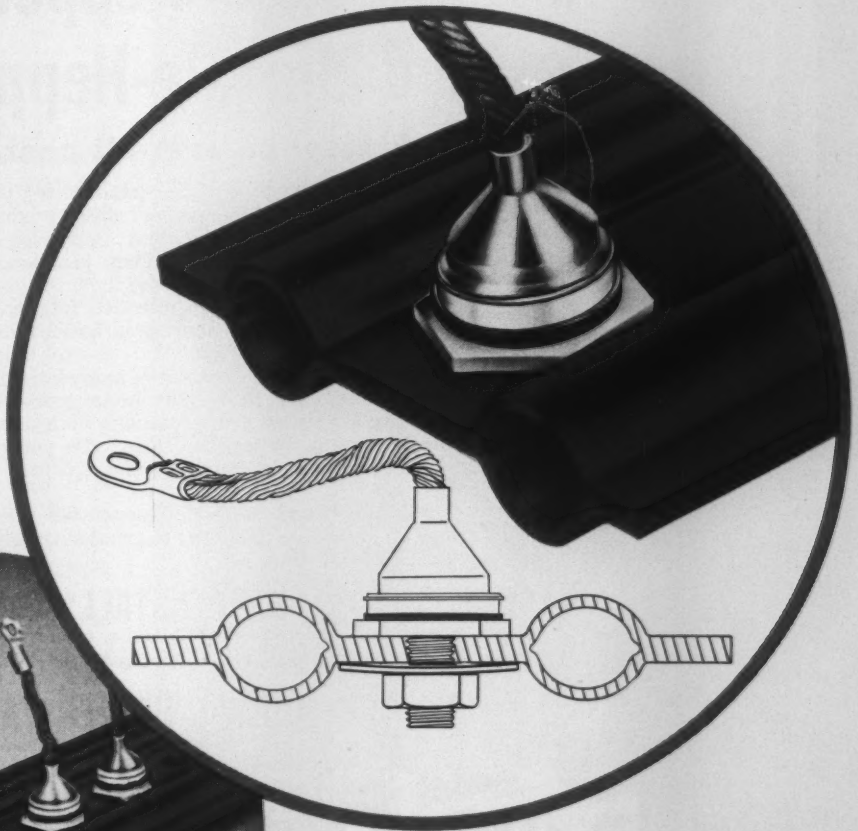


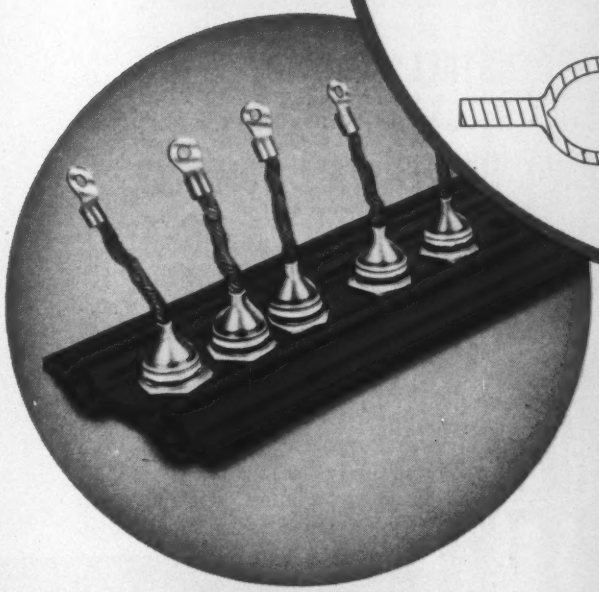
Copper Tube-In-Strip and copper fin assembly for automobile radiator.

Copper Tube-In-Strip and finned stock assembled and then inflated into automotive air conditioning coil.

ANOTHER TRIUMPH!

PHOTO IN CIRCLE ABOVE SHOWS water-cooled semiconductor power rectifier design with integrally mounted transformer as made by General Electric Company. Rated 150 volts, 4000 amps., d-c, it is used for copper refining.





(Above) **CROSS SECTION** of water-cooled bus, featuring improved cooling method. Dual, leak-proof water passages are formed in solid bus, made from Revere Tube-In-Strip, without the need for welding or brazing. They are located on each side of a section of bus to which silicon cells can be bolted without penetrating the coolant passages.

(Left) **OVERALL VIEW** of new sealed liquid-cooled bus illustrating manner of mounting several silicon rectifier cells. Unique "dry" mounting permits installation of cells without draining liquid from bus. Cells are individually attached to the bus with threaded stud and nut, simplifying the mounting of a cell, and making it unnecessary to disturb any of the other cells on the bus.

back-up roll SLEEVES custom-built by Heppenstall and Midvale-Heppenstall

work to your over-all cost advantage

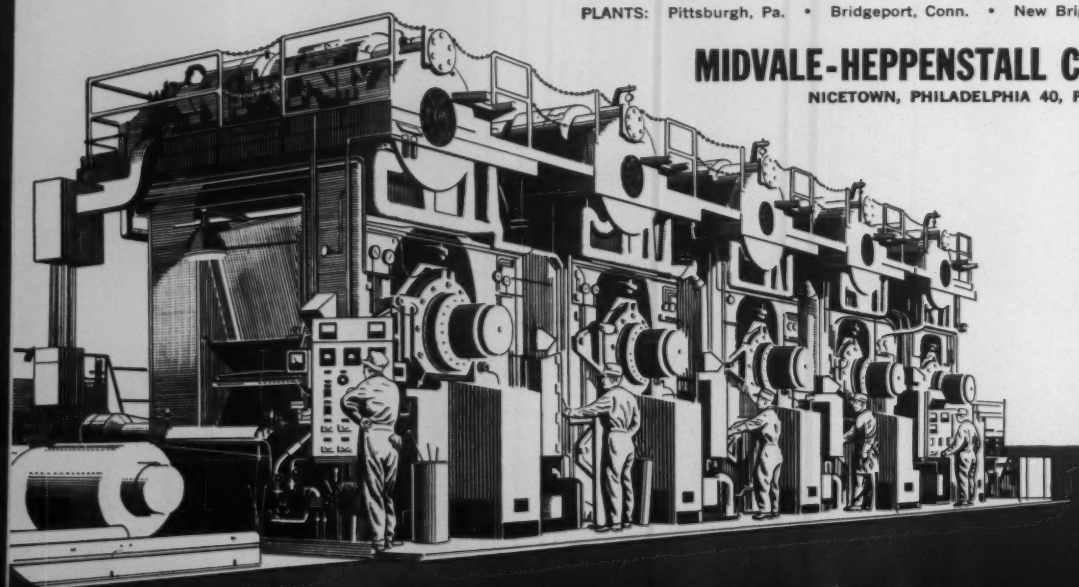
Heppenstall and Midvale-Heppenstall Back-Up Roll Sleeves reflect the long experience of two pioneer sleeve producers. These sleeves enable you to roll record tonnages . . . decrease downtime . . . and effect over-all cost reduction. They give longer working life in today's high-speed mills because their up-to-the-minute design permits utilization of more effective forging and heat treating operations. Each sleeve's working surface is *tempered to meet your exact hardness specification.*

These mandrel-forged sleeves — made from highest quality alloy steel — are worked thoroughly under modern hydraulic presses to produce a finished product having both maximum density and grain refinement. In addition, they offer you exactness of fit and greater resistance to cracking and spalling during high-speed rolling.

Heppenstall and Midvale-Heppenstall also produce forged arbors . . . and have facilities to grind both arbors and sleeves for perfect shrink-fitting.

HEPPENSTALL COMPANY
PITTSBURGH 1, PENNSYLVANIA
PLANTS: Pittsburgh, Pa. • Bridgeport, Conn. • New Brighton, Pa.

MIDVALE-HEPPENSTALL COMPANY
NICETOWN, PHILADELPHIA 40, PA.



Setup Pre-Refines Molten Iron For Use In Electric Furnace

The openhearth is well suited for refining molten metal; the electric furnace is not.

A new British steelmaking process solves this problem by pre-refining the hot metal with oxygen.

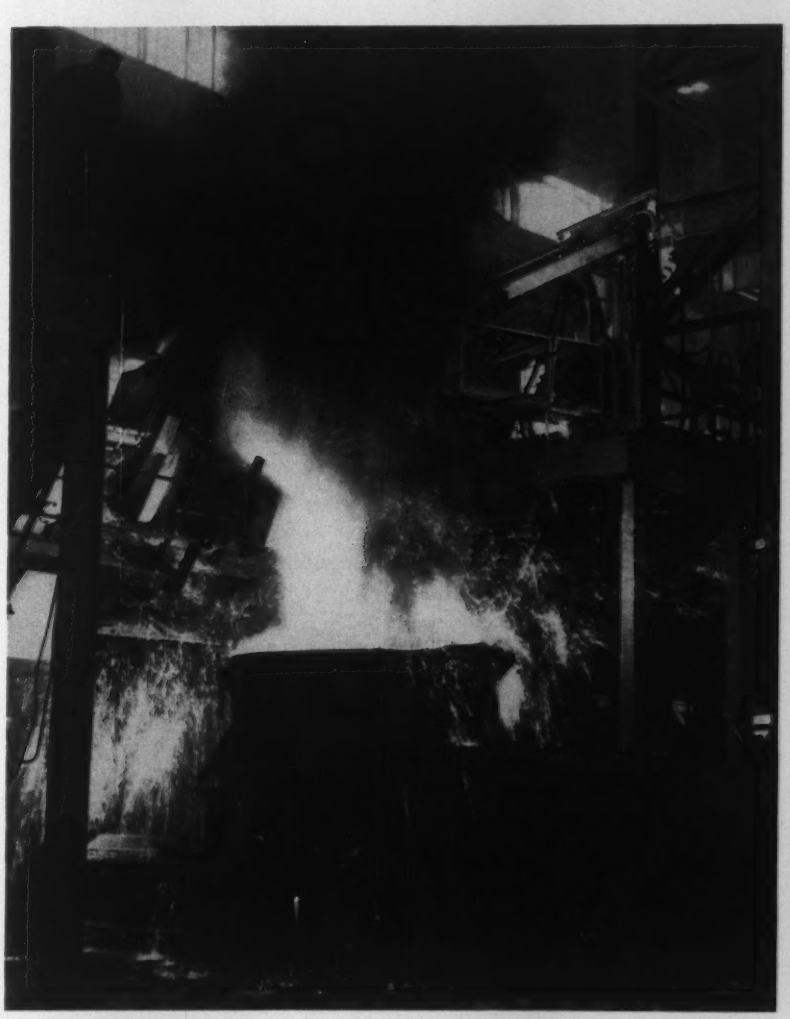
■ Here is a unique steelmaking process, which permits hot blast furnace metal to be pre-refined and charged right into electric furnaces. It is the main feature of a $6,000,000 development now completed at Brymbo Steel Works, Ltd., Wrexham, Britain.

The new technique speeds up and cheapens steelmaking in electric furnaces and makes Brymbo one of the two biggest all-electric steelworks in Britain.

Problems Arise — The development came about because Brymbo wished to continue the operation of the blast furnace in conjunction with electric furnaces. But problems arise when an electric furnace is charged with hot metal.

Refining silicon, phosphorous and more than 1 pct carbon from molten metal in an electric-arc furnace is, for all practical purposes, impossible. The action is slow, and the amount of basic slag necessary to "fix" the phosphorous leads to severe wear on the electrodes and high electric-power consumption.

A normal answer to the problem is to treat the metal by a duplex operation: charge the blast furnace metal in a Bessemer converter to remove the metalloid impurities; then transfer to the arc furnace for deoxidizing and finishing.



TAPS PRE-REFINER: The Brymbo unit pre-refines with oxygen about 20 tons of molten iron per hour. A tilting arrangement facilitates tapping.

Low Phosphorous—But this solution is no good for Brymbo blast furnace metal; the phosphorous content is too low to enable the converter to blow the metal to a workable temperature.

In its place, the Brymbo process calls for pre-refining with oxygen. This is claimed to be superior to the ordinary duplex treatment for several reasons: the blown metal retains a fairly low melting point making it easy-to-handle; final decarburization in the arc furnace, using the oxygen lance, is simple and rapid, and the overall metal recovery is high.

The pre-refining unit now in op-

eration at Brymbo refines 20 tons per hour of molten iron. It consists of a deep, circular-shaped hearth, 16 ft in diameter; it has a basic (dolomite) lining and a high alumina brick roof. The unit rests on rockers and rollers so that it can be tilted; the axis of tilt is so arranged that the water-cooled duct for removing fumes and products of combustion operates at all angles.

Needs Deep Hearth—To control the foaming slag, the design calls for a deep hearth and oil burners mounted tangentally in the walls. The burners have an odd feature in that their air supply passes under the furnace hearth to obtain a degree of pre-heat and cools the hearth at the same time. The air can also be enriched with oxygen tapped off the main supply.

Water-cooled "jets" or "lances" inject oxygen into the metal for the ore-refining operation. One of these protrudes into the furnace on the axis of tilt and thus operates when the furnace is tilted. The other must be withdrawn.

However, new versions of the unit will have, instead, a vertical lance through the roof which also injects lime. These lances inject oxygen at a rate of 800 cfm. Oxygen may also be introduced into the metal through "dry" lances, pushed over the working door sill.

Uses Fluidized Powders—A feature of the Brymbo pre-refining furnace, again probably unique in Great Britain, is the use of fluidized powdered lime and limestone. These materials feed into the metal along with the stream of oxygen to form the slag.

Tests show that this is a far more effective way of making a fluid and reactive basic slag than relying on solid material thrown onto the metal surface.

Another advantage of the pre-refiner is its ability to absorb large quantities of large-sized and awkwardly-shaped scrap. Large lumps of pit scrap cannot be satisfactorily melted in the arc furnace because they tend to cause electrode breakage; in the pre-refiner they are consumed easily and cheaply. High silicon skull and scrap can be similarly melted.

Has Three Furnaces—The new oxygen - electric melting shop at Brymbo consists of two parallel bays 432 ft long by 50 ft wide in a steel framed building. There are three 40-ton arc furnaces, one 150-ton mixer, and one 20-ton oxygen pre-refiner vessel.

Immediately behind the furnaces are the storage bunkers holding the flux materials, which are fed into the furnaces by a mobile charger. The working platform under the furnaces is 18 ft high, and is so designed that floor space is available under it for storage purposes.

Railway lines are laid under the platform to enable the slag cars to be changed without interfering with the operations on the working platform.

To Improve Efficiency—In mid-1959, the refining of a heat in the new Brymbo pre-refining furnace takes about 1 to 1½ hr. The table shows the working data of a typical heat. It is expected, however, that these figures will be improved upon.

One method proposed to increase iron recovery is by re-charging the pre-refiner with some of the final slag produced after final decarburization in the arc furnace. This slag tends to be high on iron oxide but low in phosphorous.

After removal from the pre-refiner, the hot metal is transferred at once to one of the three new 40-ton electric arc furnaces in which the scrap has been brought to a state of incipient melting.

Half is Hot Metal—A 40-ton arc furnace in the new melting shop at Brymbo operates on a charge of about 45-50 pct hot metal. At present, it turns out heats at the rate of one every 4½ hr (tap-to-tap time).

A typical electric furnace heat made under these conditions is as follows:

2:50 pm Last tap, furnace fettled
3:35 pm 25 tons of scrap charged; power on at 325 v and 20,000 amp to melt down
5:05 pm 20 tons pre-refined iron charged
5:35 pm Temperature 1520°C
5:50 pm Oxygen blown intermittently for 25 minutes through ¾ in. pipe; suitable additions of lime and limestone made to slag.

Pre-Refining Data Show Gains

Analyses, pct

Hot Blast furnace metal		Pre-refined metal	Slag	
C	4.15	1.68	CaO	43.2
Si	0.47	Trace	SiO_2	14.8
S	0.48	0.04	P_2O_5	9.1
P	0.63	0.036	Fe	6.9
Mn	0.85	0.14		

Total heat time, (charge to tap), hr	1 – 1½
Oxygen used per ton of metal, cu ft	1000
Scrap melted, pct	6.55
Overall efficiency of oxygen usage, pct	100 plus
Overall yield of metal, pct	93
Rise in temperature, °C	150

6:35 pm Sample taken, 0.56 pct carbon

6:55 pm Manganese added

7:20 pm Tapped silico - manganese steel—0.55 pct C, 0.82 pct Mn, 1.9 pct Si, 0.034 pct S, 0.025 pct P

Takes Less Power — For steel made this way, the electric power consumption works out at an average of 395 kw-hr per ton, and the oxygen consumption in the electric furnace at 460 cu-ft per ton. Counting the oxygen used in the pre-refining furnace, the total oxygen consumption is 900 cu-ft per ton.

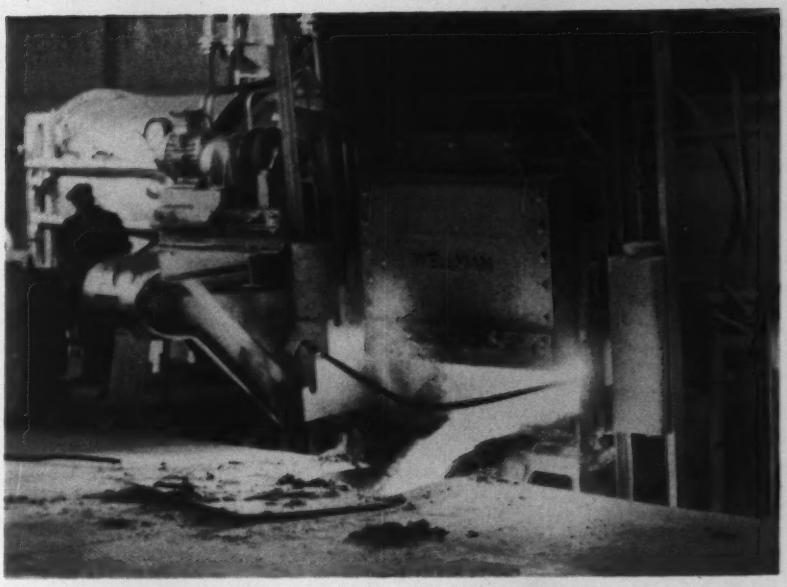
For the same type of steel made in the old 30-ton electric furnaces working on all-scrap charges, the usual heat time and power consumption is, in many instances, double this figure; and total oxygen consumption averages 500 cu-ft per ton.

Oxygen Supply—To supply the large quantities of oxygen, an oxygen plant was built at Brymbo to supply 24,000 cu ft per hour. The medium pressure cycle unit was made by Air Products (Great Britain) Ltd.

There is no reason to think that the system of pre-refining now in operation at Brymbo must be confined to electric steel plants. Unlike his Continental competitor, the British openhearth steelmaker normally works with a pig iron containing anything up to 1 pct phosphorous. In Germany, for example, openhearth furnaces all operate with "stahleisen" pig iron which never contains more than 0.2 pct phosphorous.

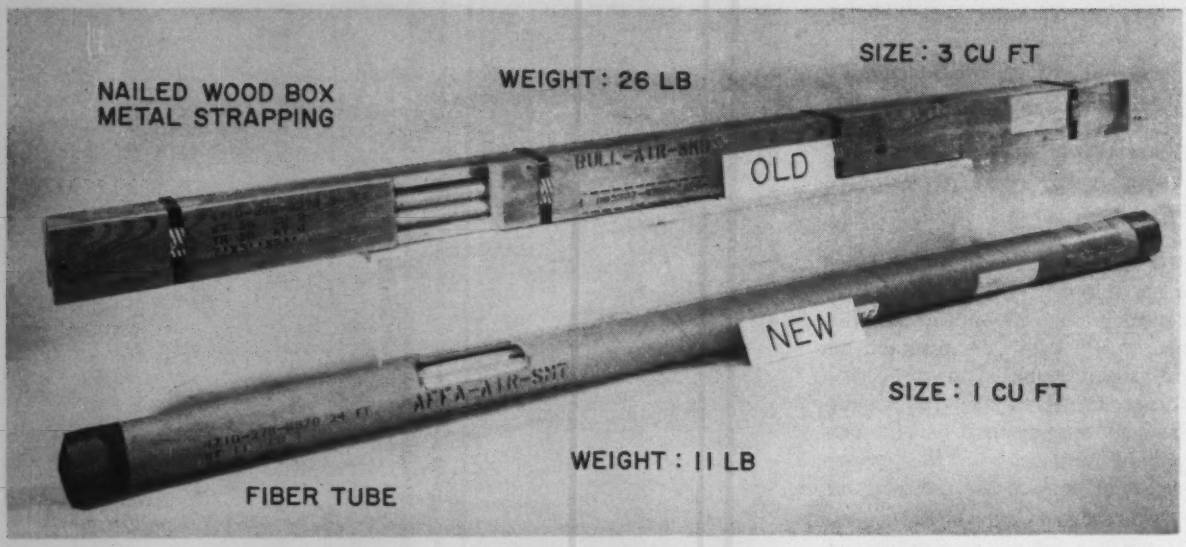
The Brymbo pre-refiner development shows that there is no technical reason why British openhearth operators should not now enjoy the same advantages.

Reprints of this article are available as long as the supply lasts. Write Reader Service Dept., The IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.



SLAGGING-OFF: Unique feature of furnace is use of fluidized powdered lime and limestone. Result is a fluid and reactive basic slag.

CHARGES INTO ARC FURNACE: After pre-refining, the metal is charged to 40-ton electric arc furnace. Here, heats are turned out every 4½ hours, giving a productivity of about 10 tons per hour.



QUICK COMPARISON—New method of packaging aluminum tubing cuts 15 lb from shipping weight.

Package for Protection Against Handling Hazards

By **Col. B. B. Abrams**—Commanding Officer, Rossford Ordnance Depot, Toledo

Protection should be the main concern in packaging your products.

A well-planned program insures maximum protection—and often reduces container size requirements.

▪ Like many industries, our Department of Defense is concerned with proper packaging of supplies and equipment.

Several years ago, the Department issued a directive to establish general policies for uniform preservation, packaging and marking of military supply items.

The main objective of the directive is to effect savings: ". . . by assuring the use of packages and shipping containers of a minimum weight and cube, consistent with

SAVES WEIGHT—The new packaging method provides a 36-lb saving on the shipping weight of a power supply unit. Size is down 5.6 cu ft.

anticipated storage and shipping hazards."

Basic Data—To provide basic information, the Army, Navy and Air Force issue their own regulations. These regulations fulfill the Defense Department's directive. They also provide a means of enforcement.

All of these regulations establish uniform policies to determine and prevent overpackaging. They supersede excessive and uneconomical earlier requirements; provide guides for identification of overpackaging; and preclude uneconomical packaging methods.

Packaging School—The Rossford Ordnance Depot conducts the Department of Defense Joint Military Packaging Training Center, at Toledo. This school develops well-trained personnel in the packaging field.

The center maintains a four week resident course. This course is offered to qualified representatives of industries which have contracts with the government. It covers the preservation, packaging and carloading of military supplies and equipment.

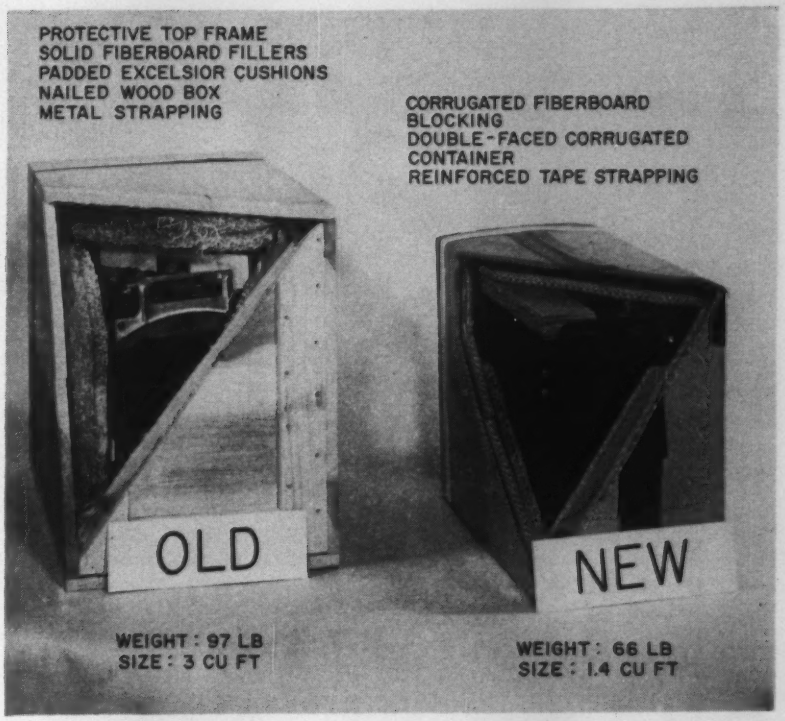
Military and civil service personnel attend classes. Also eligible are suppliers of (government) packaging materials.

Drop Test—Packages must withstand tests for selected methods of preservation. When contracts specify, rough handling tests are preformed on completed containers.

The free fall drop test is often used. A technician drops the container from a height of 30 in. onto a steel, concrete or stone surface. Drops are repeated until each of the eight corners receive a fall.

After the drops, the technician conducts additional tests. These tests detect leaks in barrier materials, seals and closures. Then, blocking and cushioning is checked.

The tests insure protection of military supplies. They are also adaptable to civilian industrial usage. Other tests simulate actual shipping and storage conditions as closely as possible.



COSTS DOWN—Shipping, packaging and storage costs are all reduced. Overall size is cut in half. This saves 31 lb.

STEP-BY-STEP—Illustration clearly shows how a total savings of 16 lbs is effected in properly packaging concentrated sulfuric acid.

DUAL PRESS SETUP: Carbide dies cold extrude about 100,000 stainless steel propeller shafts.

Cold Extrude Stainless Shafts

Machining parts from stainless bar stock can be an expensive business. One sucessful way to handle the problem is with cold extrusion.

By R. H. Eshelman,
Machinery Editor

▪ Cold forming of stepped, stainless shafts seems to be the answer to many design and production problems for a major manufacturer of outboard motors.

Designers at Evinrude Motors, Milwaukee, insist on stainless as the material for its propeller and drive shafts. Since these parts spend most of their time in contact with water, stainless does a good job of combating any possible effects of corrosion.

Formerly, these parts were machined. But problems were involved. As soon as you turn such parts from bar stock, then subject them to heat treating, there's the danger of excessive warpage. Yet, design specs required the parts to be hardened to 36 to 40 Rc.

Another problem was a cost factor. Stainless bar stock runs about 67¢ lb for this size. But the price for stainless scrap is only 6¢ lb. It's obvious that generous savings can be realized by reducing the amount of machine scrap.

Solving the Problem—The work force at Molloy Mfg. Div., Molloy Industries, Inc., Detroit, picked up the ball and searched for some answers to Evinrude's problem. Molloy engineers then consulted with the Jones & Laughlin Steel Corp., Stainless Steel Div., Detroit, for some help on the metallurgical end.

The result: Shafts are now extruded in five diameters, eliminating four machining operations. It also means quite a saving in materials.

The cold-formed part has made quite a difference on Evinrude's production line. Now that grinding operations can be done on standard precision grinders, specific grinders can be freed for other work when needed.

The reduction in precise machine work spells economy, too. Previous turning operations have been eliminated, leaving only rough and finish grind operations. Size of the shaft is 1-in. nominal diameter, 12 13/16 in. length. Grinding speeds in finishing the extruded piece vary from 180 to 300 rpm.

Built to Last—Under the new setup, the shafts are expected to outlast the life of the motor. The same type propeller shaft is used on all models of the line, right across the board.

Engineers at Molloy know that cold extrusion only pays off when certain conditions are met. The technique should only be applied on pieces that are round or symmetrical. In other words, avoid odd-shaped, off-center parts. Also, are good materials savings possible?

In the attempt to cut down on scrap, will conditions permit you to bypass machining or other operations? Finally, cold extrusion setups require that money be spent for tooling and development. Is enough

quantity involved to offset such costs?

Much of Molloy's success depends on its attention to details. Die design, of course, is important. You must be able to judge how much metal you can flow in one step. Equally important is the knowledge of stock uniformity and proper surface preparation.

Uniform Stock—The importance of uniformity of stock is confirmed by W. H. Braun, Chief Laboratory Metallurgist at J & L's Stainless Steel Div. He reports: "Type 410 stainless has worked well in this application primarily because of good internal and surface quality.

"Understanding and strict adherence to materials specifications insures proper performance in this difficult operation."

He adds that basic quality of material starts at the melt shop level. It must be preserved throughout mill processing, with careful attention given to details of part design requirements. It's this uniform grain structure that is essential for proper metal flow in the dies.

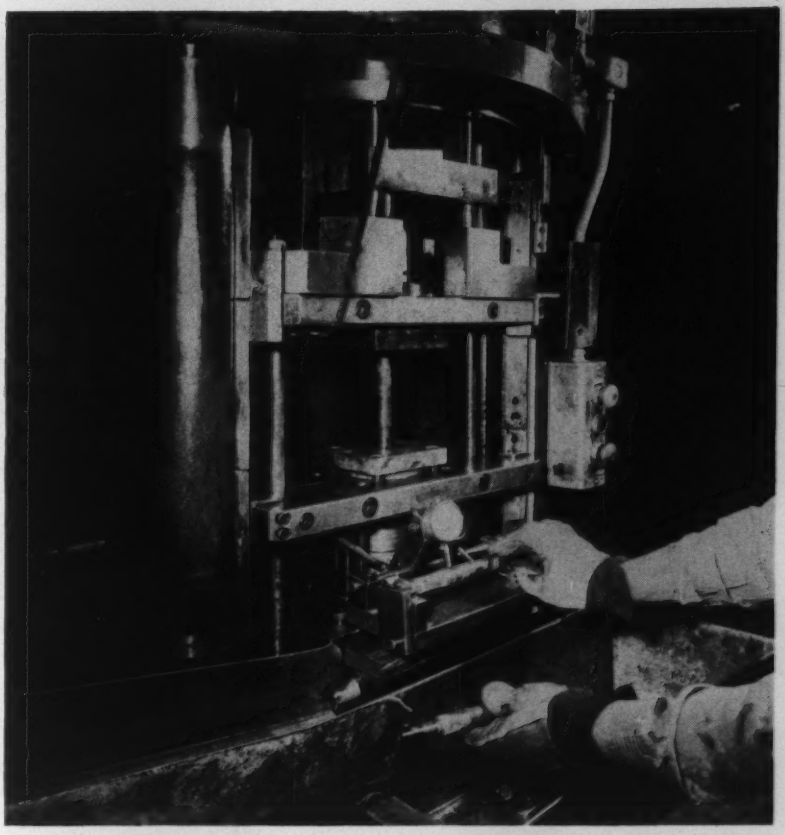
Lubrication is very important in this cold-forming setup. A special chemical treatment converts the outer metal surface into an oxalate layer. The usual zinc-type treatment doesn't adhere to stainless.

Protecting the Surface—A standard complex soap-type lubricant goes on top. This results in a tight, solid surface. In fact, parts can even be stored for long periods.

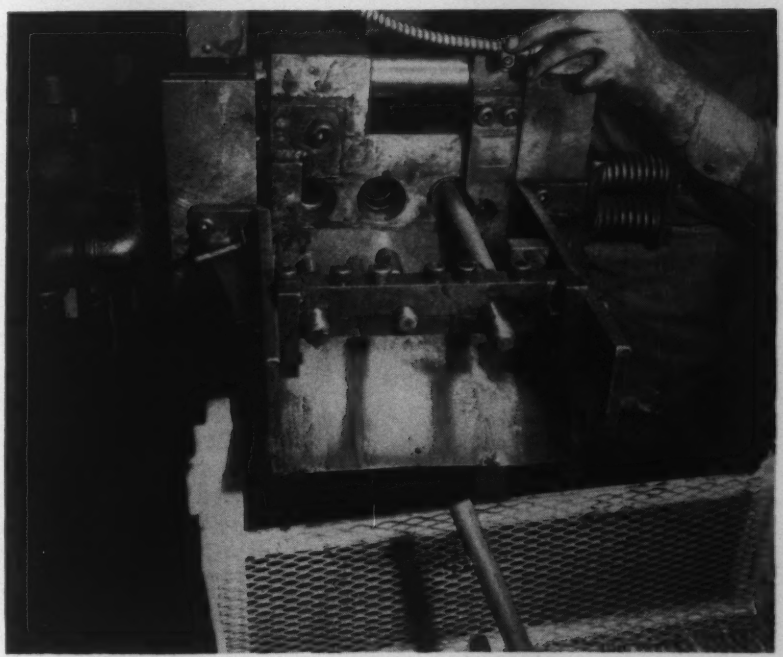
Shop processing calls for only three steps. The first one includes shot blast cleaning and cutoff. Next, surfaces are prepared in two dips; one, oxalate and the other dry lubricant.

And finally there are two press forming operations. The first might be termed a cold forging and rough forming of the shaft diameters. The second one resembles a push-drawing or coining to size and shape.

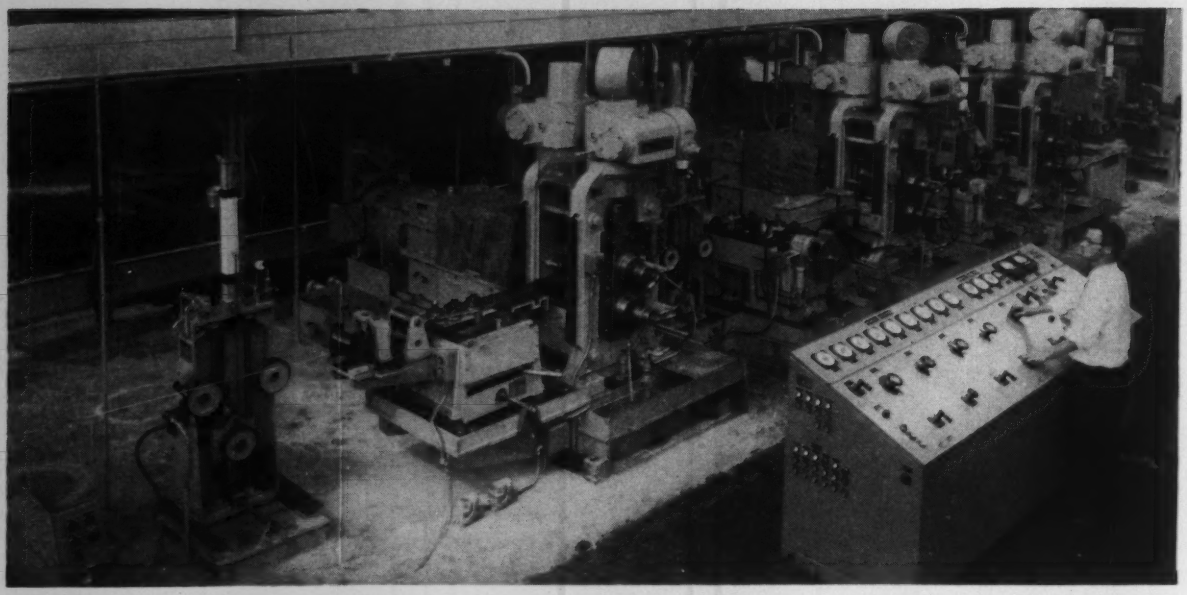
Finishing at the Evinrude plant consists of grinding, spline rolling, cutting a key-slot and drilling a cotter hole. The parts are then ready for assembly.



QUALITY CONTROL: After final press forming, operators check major diameter on stainless steel propeller shafts to ± 0.005 in.



SHAPING TO SIZE: Cut-off dies chop stainless Type 410 blanks to size. Bar stock is previously cleaned by shot-blast.



THREE-IN-ONE LINE: Sequence of stands progressively reduces circular wire to a rectangular cross section.

Controls on Flat-Wire Mill Insure Fast, Versatile Output

By H. C. Swartfiguer and R. K. Larson—General Electric Co., Schenectady

As mill speeds increase, drive systems have to keep pace with fast moving changes.

This unit's automatic control system retains precision at high operating speeds.

▪ High operating speed, wide range of wire sizes, and high rolling precision on both large and small wire sizes — these are the advantages combined in a new 60-ft long three-stand mill.

It gets its performance through basic mill design and an electrical drive system with virtually automatic stand speed control. The unit, installed last fall at GE's Small AC Motor and Generator Dept., has a rolling speed of about five times that of conventional mills.

In operation, a flat-wire mill reduces circular wire to a rectangular cross section. It's a tandem mill that progressively produces the specified wire thickness and width in two or more alternate flattening and edging stands.

Relative Speeds Vital—Maintaining proper relative speeds of the rolling stands is vital, since the lineal dimension of the wire changes with the cross section at each stand. Improper speeds cause excessive tension or slack between stands, resulting in either stretching or looping of the wire. It's all the more important at output rates from 500 to 3500 fpm, as compared to a maximum finishing speed of 400 fpm on many older mills.

This unit's electrical drive system provides an unusual degree of stand speed control, either with a dancer-roll attachment or in straight-through operation with automatic load compensation. And there's no need for continuous attention by an operator.

A Combined Project—The new mill was designed and built by the Machine Div., The Torrington Mfg. Co., Torrington, Conn. GE engineered and built the electrical system, which was then applied to the mill by Torrington.

Flat-wire output of the new mill is used primarily for motor and generator windings and in transformers. The mill consists of three flattening stands, two edging stands and the payoff and take-up stands with each driven by an individual dc motor.

Supplied on either 500- or 2000-lb reels, round copper wire from 0.060 to 0.410 in. diam is processed through the mill. Finished flat-wire sizes range from a minimum of 0.020 x 0.100 in. to a maximum of 0.200 x 0.610 in. on reels or coils carrying from 250 to 1000 lb.

Depends on Cross Section—Although the machine can operate at output speeds up 3500 fpm, the range of this installation is between 670 and 2200 fpm at the take-up stand. Optimum finishing speed is roughly inversely proportional to the cross-sectional area of the finished wire.

The total cost of the flat-wire mill with its electrical drive system was significantly lower than if an equivalent number of smaller low-speed mills had been specified. Rolling speeds as much as four times that of the conventional mills save on machine time and labor cost in rolling a given quantity of wire.

Production time on the high-speed mill is further reduced by the need for only one pass to produce finish sizes. Multiple passes are often required on single or two-stand gear connected mills where the inflexibility of stand speeds does not permit optimum flattening schedules.

Needs Less Supervision — Reduced machine time cuts labor cost. In addition, the automatic drive system requires supervision of only one operator, whereas a number of low-speed machines with the same total output would each require an operator.

The setup produces dimensional tolerances of ± 0.0005 in. on width and ± 0.00025 in. on thickness as a matter of course. Actually, allowable dimensional tolerances are presently much larger: ± 1 pct.

Reduction in production cost depends much on quantity. Set-up time is not particularly critical, since the increase in set-up time is comparatively small.

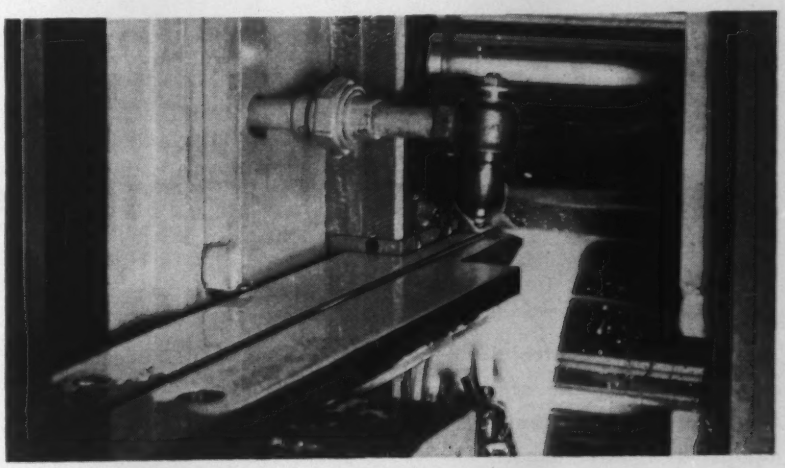
Orders Large and Small — The larger packages the new mill is capable of handling offsets this difference in set-up time. While orders will be generally for quantities over 1000 lb, the new mill will frequently be used to advantage for smaller quantities, because of its superior dimensional control and ability to roll rush orders quickly.

Vernier speed control is added to the inherent drive synchronization by four dancer rolls. As the tension in the wire increases—for example, when the payoff reel is turning slightly slow in relation to the first flattening mill—the floating roll is lifted by the wire.

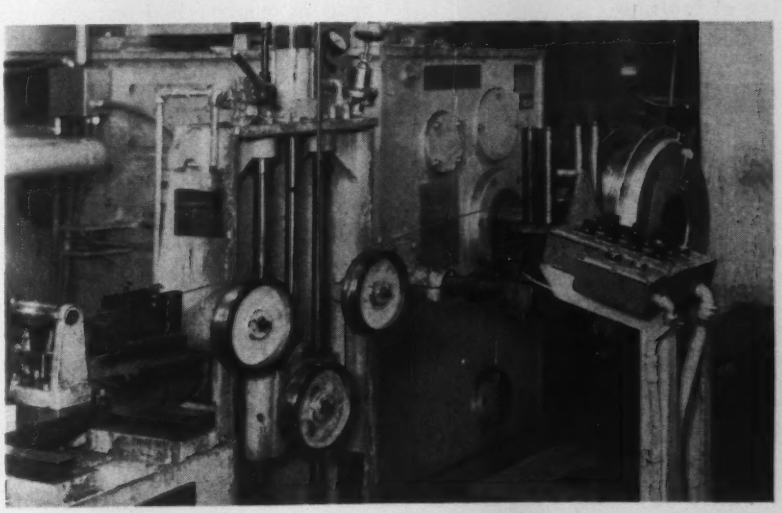
As the roll rises it transmits an electrical signal to the dc motor driving the payoff. The signal increases voltage to raise motor speed just enough to eliminate the high tension condition. The floating roll then drops to its normal position.

Center Adjustment—For a given rolling schedule, the air pressure at each dancer stand is set so that proper tension exists with the floating roll located in the center of its range. If the floating roll travels too high or too low in maintaining proper tension, the speed of the appropriate motor is adjusted manually by changing the shunt-field rheostat at the control desk.

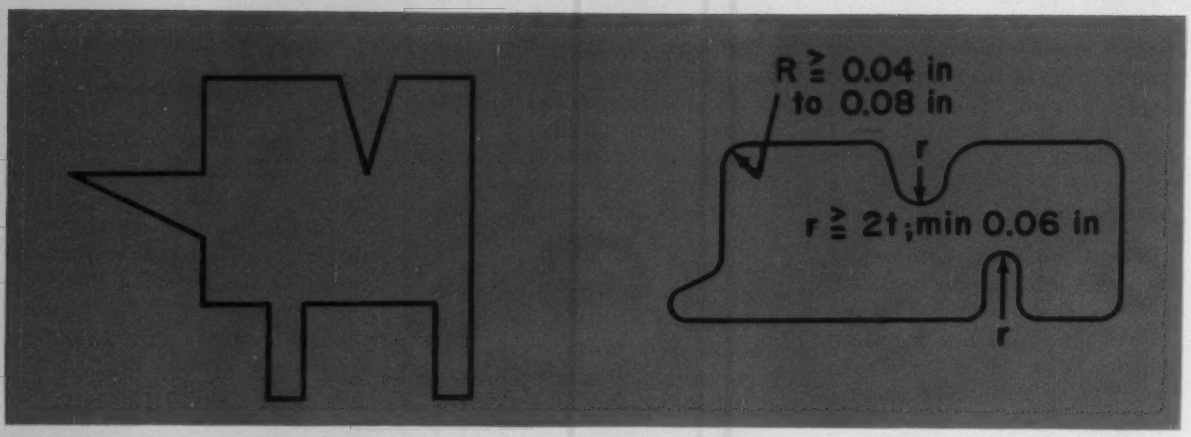
A selector switch on the operator's desk permits operation of the mill either straight through or with dancer roll control.



FROM ROUND TO FLAT: Coolant pours on the round wire as it passes between the rolls of the first or "breakdown" flattening stand.



TENSION CONTROL: After passing through magnetic gages, rectangular wire passes around dancer roll that controls take-up speed.



DESIGN COMES FIRST: Sharp corners and points, and narrow slots in blank on left encourage rapid wear and early burr formation. Shape of blank on the right is modified to avoid such typical defects.

How Control of Burrs Aids Sheet Metal Stamping

By Federico Strasser—Consultant, Santiago, Chile

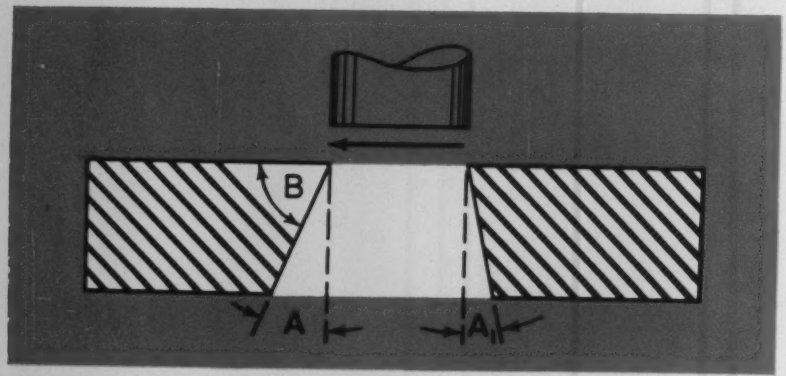
Effective burr control not only adds to quality of stampings, but gives further benefits in equipment maintenance.

It's done through preventive means and frequent resharpening of tools.

▪ Whenever part designers prescribe stampings without any burrs, it's like asking for the impossible. It's an established fact that progressive dulling of edges of cutting dies will cause burrs.

After a certain number of operations in blanking and piercing, the outer contour of the blanks and the periphery of the pierced holes throw up more or less pronounced burrs. This is a natural process and there's no possibility of producing totally burrless stampings.

As long as burr height remains below certain limits, it does no harm. But as soon as it becomes excessive, the tool must be resharpened.



ALL-IMPORTANT ANGLES: Good cutting and slow burr formation results from having die clearance angle A rather small to make cutting angle B large. Clearance angles (A and A_1) should be uniform, otherwise the punch will be thrown against the side of greater clearance angle.

Each Case Varies—The maximum allowable burr height is different in every case. It depends chiefly on the function of the workpieces, and the kind and number of further forming operations to which the blanks will be submitted.

As a matter of fact, very few shops have even set up standards for burr heights. This is probably due to the fact that until recently there have been no instruments for measuring burr height.

The following data may serve as a start: For thin sheet (0.005 in.), allow 0.001-in. burr height; for

thicker sheet (0.062 in.), allow 0.005-in. burr height. For gages in between, allowances will be proportional.

Check Other Factors — Other factors than the function of the stampings sometimes determine maximum burr height. While in many cases, the stamping could work effectively with a comparatively high burr, there may be several maintenance advantages in reconditioning the tool earlier.

By so doing, there is less tool wear and grinding time is less. There's also less danger of serious tool and machine breakdowns.

On the other hand, there are cases where burr-height tolerances are larger than they should be. It's because subsequent steps provide for burr removal.

You Can Deburr—This deburring process may be effected in short-run jobs by several means, such as scraping, filing, grinding, sanding with coated abrasives, planishing, wire brushing, or ultrasonics. In the case of mass production of stampings, it's more economical and more efficient to do it by tumbling.

Burr removal is an extra operation, and it's expensive if height is considerable. Therefore, the best policy is not to remove burrs, but to control their formation so that they are held under acceptable values. Control is done through preventive means and frequent resharpening of tools.

Control is Better—To decrease formation of burrs, it's important to examine the factors which cause their formation. The factors which determine formation of burrs are practically the same as those which limit tool life. It's all related to causes of wear on cutting edges of punches and die openings.

These determining factors fall into four groups: the stamping (the shape and the kind and thickness of stock); the tool (its design and construction); the machine (selection of press, stamping speed); the operation (die setting, stock lubrication, handling and construction).

Stress Design—Stamping design has a decided influence on burr formation. Sharp corners, sharp points, narrow slots provoke more rapid wear of cutting edges than simple cutting shapes. The component designer should thus try to avoid such unsatisfactory contour details.

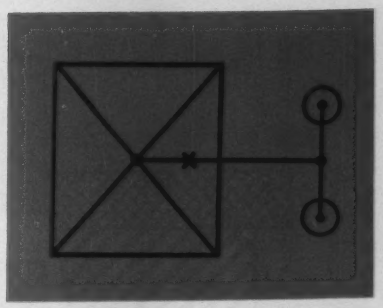
Softer metals do not lend themselves to cutting operations as readily as harder stock. Consequently the former ones have a greater tendency to form burrs than harder metals.

Thin stock, especially in large stampings, has a tendency to bow and thus cause easier burr formation. One remedy is to provide very small punch clearances.

Die Angles Vital—Angular clearance of the die opening is important. By making die clearance angle of the die plate opening small, then the cutting angle is larger. Such a cutting edge will wear more slowly and burr formation will be delayed.

At the same time, it's important to have angular clearance uniform at every point of the cutting periphery. If it isn't, the punch will be thrown against the side of greater clearance angle where cutting action is easier. The result is premature burr formation.

Punch clearance, the difference between punch size and die opening, must be neither too small nor too large. Both extremes cause early burr formation, greater clearance being the more serious.



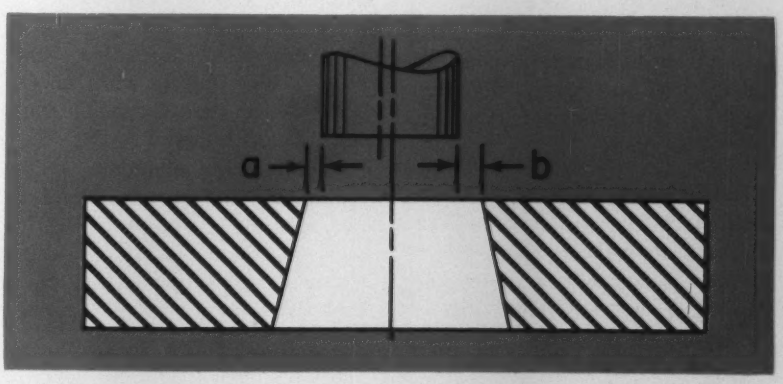
FIND CENTER OF CUT: Punch shank axis must coincide with center of cut of all cutting edges (X); otherwise punches get misaligned.

Set Even Clearance — Not only must punch clearance be of the correct value, but it must also be uniformly distributed around the cutting contour. Even a slight unevenness will cause quick dulling of cutting edges.

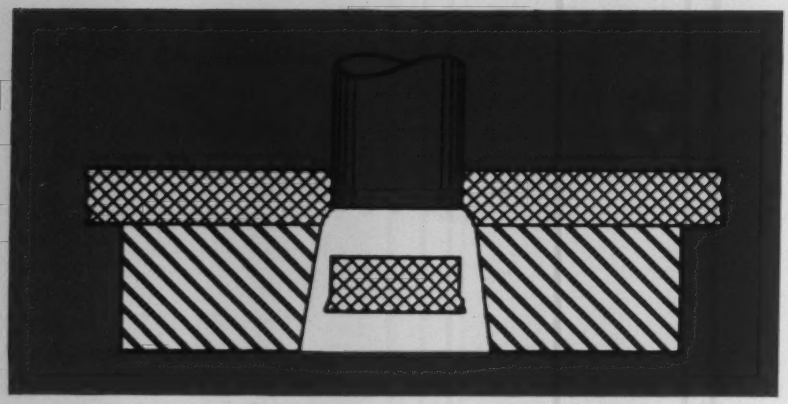
After long use, the tool members suffer dimensional changes. The punch becomes smaller through wear and the cutting opening is enlarged by repeated resharpening.

Burr formation is thus greatly increased, it being the effect of too large a punch clearance. The only remedy is to replace both punch and die plate.

Some toolmakers restore die opening size, closing it by peening. But this is poor policy, because angular clearance is increased and



CHECK PUNCH CLEARANCE: Not only must punch clearance be of the correct value, but it must also be evenly distributed. Early burr formation and quick dulling of edges result from even slight unevenness.



PUNCH AVOIDS CONTACT: Punch need not enter die opening for best cutting action. To avoid metal-to-metal contact between punch and die plate, bumper blocks may be installed between stripper and punch plate.

premature burr formation happens again.

Watch Swap of Materials — It's wise not to use a die set for a given stock on another type of material having different properties and characteristics unless the new stock requires exactly the same punch clearances as the original metal. Otherwise, early burr formation will be the result.

For best working conditions, the punch shank axis must coincide with the "center of cut" of all cutting edges. If they don't coincide, the punches may be thrown easily out of alignment and will cause early burr formation.

The cutting faces of the die should be held always perfectly parallel to each other during cutting action. Misalignments produce metal - to - metal contact between punch and die plate and will cause severe damage to cutting edges. It's a defect that may be caused by having the punch holder not parallel to the bolster plate.

Hard-Chrome Plating—Excellent results have been obtained by hard-chrome-plating the cutting edges of the dies. The keenness of the cutting edges and the dimensions of the cutting members last longer and delay burr formation.

It's an established fact that it's not necessary for the punch to pass completely through the stock. It's even more important that it not enter the die opening.

Thus in order to avoid metal-to-metal contact between punch and die plate, cutting dies should be fitted with bumper blocks between stripper and punch plate. Bumper blocks are especially needed for presses that are not in first-class condition with play between moving parts.

Strength Plays Part — Another factor in prevention of early burr formation is to insure that die members are of strong construction. Steel selection plays a big part in performance of die sets.

Also care in the heat treatment of the cutting members is important. If heat treatment is incorrectly done, cutting edges can dull prematurely.

Surface finish of both punch and die opening has great influence on the speed of burr formation. Other things being equal, with smooth cutting edges, burr formation starts later than with ragged cutting edges.

Correct scrap allowances are essential. In fact, the bridge between two adjacent blank openings in the scrap skeleton must always be strong enough to prevent its slipping between the punch and die opening.

Shear for Tough Jobs—For severe stamping conditions, it's recommended that the press be of ample capacity and have proper maintenance to insure shock- and vibration-free operation. In fact, if the press is too heavily loaded, frame deflection throws punch alignment out of axis.

If there's no press available with ample capacity, then the cutting edges must be made with shear. And the shear must be well balanced to avoid lateral thrusts.

Stamping speed also has direct effect on burr formation. It has been found that "dynamic" punching (at 1000 strokes per minute speed) has much less of a tendency to form burrs than does "static" punching with traditional press speeds.

Proper Setting a Must—The importance of proper setting of dies in the presses cannot be overemphasized. Careless and inexperienced setting can cause more damage and premature burr formation than would a very long production run at proper setting.

It's poor economy to save a few dollars on the setting job of a costly die, where a slight mistake can mean hundreds and hundreds of dollars worth of downtime and repair costs. A good toolmaker should do the job himself, or he should supervise the job and check it out before the beginning of a regular run.

The stock to be stamped should be clean, without scale or oxidation. Abrasive action of hammer or roll scale wears cutting edges quickly.

Handle Stock With Care—Careful handling of strips, coils and sheets is also important. Dust, especially from a concrete floor adheres easily to oiled surface and acts as an abrasive.

Despite those who feel that stock lubrication is not necessary, proper and adequate lubrication, in addition to helping the stamping operation, avoids premature burr formation.

The press operator should stay away from irregular operations. Cutting half blanks will throw the punch out of alignment. Also cutting double blanks is hard on tools and causes quick wear of cutting edges.

Purifier Cleans Exhaust Fumes

Oxidation Reaction Makes Gasoline-Engine Fumes Harmless

Catalytic exhaust purifiers end gasoline-engine fume hazard in a huge tool-storage cave.

Exhaust fumes become harmless carbon dioxide and water vapor.

▪ Operating gasoline-engine vehicles in any enclosed building can be hazardous. Carbon monoxide (CO) is dangerous. Hydrocarbons from vehicle exhausts are irritating.

Page Airways, Inc., Rochester, N. Y., operates a mammoth subterranean storage cave. Underground, the company maintains and rehabilitates millions of dollars worth of machine tools.

By fitting catalytic exhaust purifiers on their industrial trucks and gasoline sweepers, Page solves a hazardous fumes problem.

Comfortable Cave—As many as 150 men work in the 65-acre cave. Complete temperature and humidity control is maintained.

Catalytic exhaust purifiers insure protection against a build-up of harmful gases. Made by Oxy-Catalyst, Inc., Wayne, Pa., these units eliminate up to 95 pct of the exhaust contaminants. They convert exhaust fumes to harmless carbon dioxide and water vapor.

Purifiers on all 12 vehicles keep CO content from 10 to 100 parts-per-million level. Government regulations specify a maximum of 200 parts-per-million-parts air.

Ordnance Warehouse—In 1952, the United States Ordnance Corps took over a limestone mine—formerly used for refrigerated food storage. Today's purpose is storage and rehabilitation of machine tools brought in from deactivated war plants.

Material handling problems make combustion - engine equipment a must. Here's why. Many machine tools arrive at dock facilities, near the cave entrance, by river boat; others come via truck; some arrive by rail.

Fork trucks handle the incoming machines. These trucks maintain combined indoor - outdoor operations. About 100 yards of their outdoor run extends up a steep (11 pct) slope.

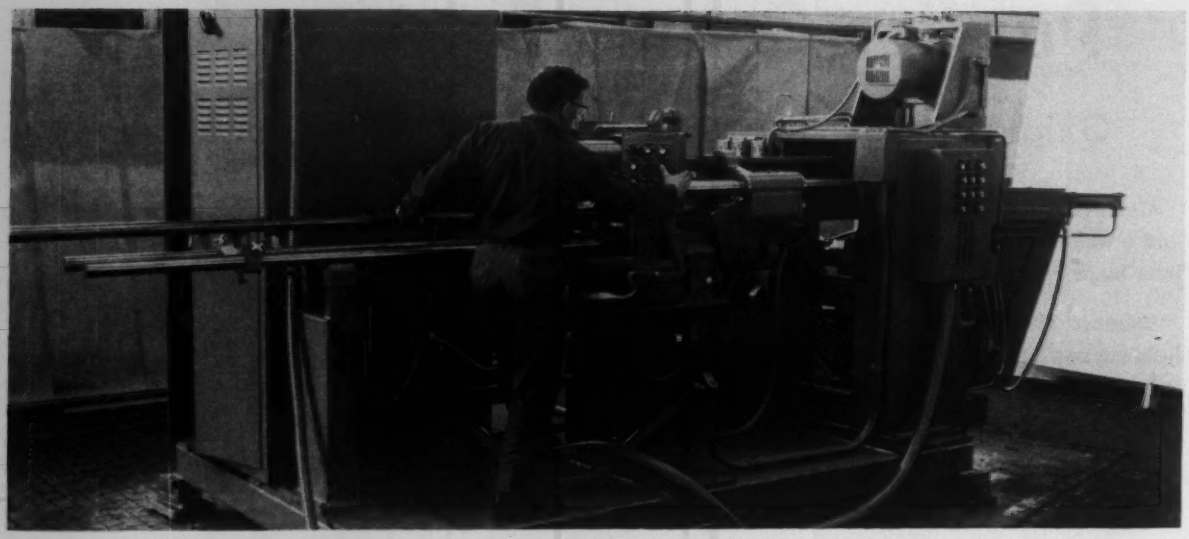
Inside the cave, the trucks make long, fast runs from a few hundred yards to a half mile or more.

Logical Choice—These factors, together with initial low cost, make gasoline equipment essential. At first, no major fumes problem occurred; but as activities were stepped up—with additional vehicles—CO buildup became alarming.

To prevent CO hazards, each vehicle has a purifier on its exhaust system. Hot exhaust gases stream through nests of catalyst-coated porcelain rods. This promotes an oxidation reaction. Incompletely burned contaminants are consumed at relatively low temperatures. Exhaust gases come out as harmless carbon dioxide and water vapor.

The estimated life of a purifier unit is 3000 hrs or more. Catalytic innards of the units are replaced on an exchange basis.

SUBTERRANEAN STORAGE—Gasoline-engine vehicles, with muffler-like exhaust purifiers, handle machinery from deactivated war plants.



AUTOMATIC CYCLE: As soon as the tubing and tape are in place, the operator just presses the button.

Tube Bending Controlled by Tape

Why stock 700 different types of parts when you can reach the same goal with as few as four?

The answer lies in tape controls. With them, distributors can reap annual savings of $55,000.

▪ If you've ever been inside the warehouse of an auto-parts distributer who stocks tailpipes, you've probably noticed the huge amount of floor space given over to the stocking of these items. Don't blame the distributor for this unsightly array of pipes. He's in business. And exhaust systems outsell any other auto part, including tires.

With the advent of dual-exhaust systems, the number of tailpipe sizes and shapes grew even more. Distributors not only went to their wit's end finding space to house the pipes, they were soon adding hundreds of new pages to their stock control records.

But if you're one of the estimated 100 distributors who sells 50,000 tailpipes each year, then your headaches are over. What's the answer? Numerical controls.

Instead of stocking over 700 different models of the part (which you must do if you expect to make prompt deliveries from the warehouse), you can now lease a tape-controlled bending machine. This unit should save about $55,000 per year from your operation. And you can produce any American tailpipe from four basic sizes of straight tubing.

Its Origin — The new machine, called the Bend-O-Matic, is marketed by Nu-Era Corp., Rochester, Mich. General Machinery Div. of Baldwin - Lima - Hamilton Corp., Philadelphia, builds the unit. Its electronic control system is engineered by General Electric Co.'s. Specialty Control Dept., Waynesboro, Va.

GE has quite a backlog of experience in point-to-point numerical positioning control, especially in automatic metalworking processes. But this is the first time its system has handled metal forming.

You couldn't ask for simpler operation. All the operator has to do is select the proper diameter from the four sizes in stock. Then he picks out the right tape and inserts it in the tape reader. From then on, he simply places the tubing into the machine, presses a button and removes the bent-to-order tailpipe after a two-minute cycle.

Every Movement—The machine controls three separate motions. Two of these motions, longitudinal and polar, are powered by thyratron drives. A bender motion is powered hydraulically.

In process, a length of straight pipe is positioned for the first bend. The numerical input dictates the degree of bend. During this time, the clamp that first carried the pipe into position retracts. Then another clamp holds the pipe during bending.

While the bend device retracts, the control readies new position data. The clamping action is again transferred to the carry-forward device and the new position data acted upon. This bending cycle continues until the final longitudinal motion is called for. At that time, the pipe

ELECTRONIC BRAINS: Foolproof workmanship takes place when paper tape is placed into the tape reader.

is positioned for cutting to desired length.

All input data are contained in 1-in. wide paper tape. The tape carries digital data for locating pipe and dictating proper bend. Special codes determine the proper mandrel, and initiate the flattening operation and the cutoff saw.

Big Savings—The new Bend-O-Matic setup provides five areas of savings. The first is floor space. Take the case of a distributor that stocks 12,500 tailpipes. Under a conventional inventory system, he must set aside 4300 sq ft to house the many models.

But straight tubing only consumes about 1800 sq ft. The machine takes up another 1500 sq ft, or a total of 3300 sq ft. Based on an annual charge of $7.20 per sq ft, the new setup can save the distributor $7200 per year.

The second area of saving is in manpower. Any distributor moving 50,000 tailpipes a year requires a work force of two or three men. By installing a Bend-O-Matic unit, one man can handle at least 100,000 tailpipes if necessary. This amounts to yearly savings of $7500.

The largest saving of all is in materials. Instead of paying the wholesale price of $2.10 for one tailpipe, the distributor can now pay $1.75 for one 16-ft length of straight tubing. Bear in mind that two tailpipes can be made from this single length. Annual saving? Based on an annual volume of 50,000—$61,000.

Obsolescence?—Distributors usually find that each year 2 to 3 pct of their stock becomes obsolete. The same distributors can get along just as well by carrying a small programmed tape for each model. Since the machine can turn out any tailpipe in two minutes, there's little need to resort to stock-piling. Another $3000 to annual savings.

The fifth item covers indirect expenses. Look at the states with personal property taxes. With the Bend-O-Matic there's no reason to clear the shelves at the end of the year to avoid high taxes.

Suppose a warehouse closes out the year with an inventory of 12,500 tailpipes and an investment of $26,250. Taxed at the rate of $49 per $1000, this amounts to $1286. But the same warehouse, ending up its year with $5280 worth of straight tubing, would pay only $258 in taxes. The saving: 80 pct.

This tape-controlled pipe bending machine is a useful, money-saving device. It should hold even greater promise in the future for uses other than those in the auto industry. Wherever thin-wall pipe must be bent, it might find a place.

How Tape-Controlled Bender Pays Off

Item	Relative Costs		
	CONVENTIONAL SYSTEM, $	BEND-O-MATIC SYSTEM, $	SAVINGS, $
Floor space	30,960	23,760	7,200
Manpower	13,500	6,000	7,500
Materials	105,000	43,750	61,250
Obsolescence	3,000	0	3,000
Taxes	1,286	258	1,028
Rental charge for equipment	0	25,000	−25,000
Total	153,746	98,768	54,978

Measure Heat of Moving Steel

Radiation Signals Give Steel Surface Temperature Readings

Thermal rays from steel strip, moving at 2000 fpm through a tinplate annealing furnace, produce a signal.

This signal provides remote readings of steel surface temperatures up to 8000°F.

▪ Radiation thermometers measure surface temperatures of steel strip moving at 2000 fpm through a tinplate annealing furnace. Thermal rays, emitted by the strip, vary as a function of the strip's temperature.

An optical mirror focuses these thermal rays on a sensitive infrared detector. The detector, located in the optical head, generates a voltage signal. This signal is proportional to radiation intensity. After amplification, the signal is fed to a meter or oscilloscope. There, conversion to temperature readings takes place.

The radiation thermometers, products of the Radiation Electronics Co., Chicago, check temperatures of moving and/or inaccessible surfaces—from room temperature to 8000°F.

Remote Readings—Operation is completely remote. Viewed surfaces can't be contaminated or damaged. The unit scans a linear field to obtain a temperature profile of the moving steel strip.

Even rapidly varying temperatures are visually monitored or permanently recorded. An optical chopper provides transient response of recorded temperatures within 10 microseconds.

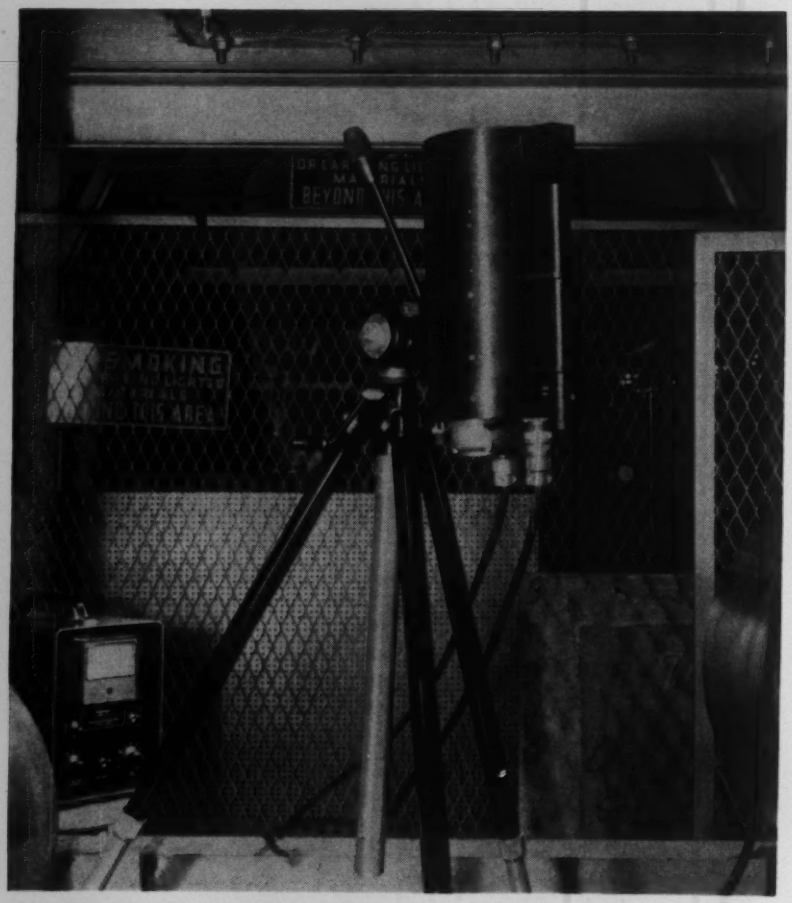
The optical head sights on the moving steel strip from any distance, 4 ft or greater. A telescopic sight provides a view of about one-half degree. This enlarges the picture presented to the infrared sensing detector.

Locate to Suit—At any working distance, the field of view resolves a spot size which varies directly with the distance. The only requirement for accurate temperature measurements is that the spot size must be smaller than the work.

For an object with a "sighted" dimension of 3 in., the optical head may be located up to 30 ft away. This flexibility permits placing the optical head in almost any convenient location.

Compact and Light—The entire unit is located below the furnace. Accurate, remote temperature readings monitor the steel strip as it moves through the tinplate annealing process.

Presetting the panel meter to a desired temperature reading provides automatic temperature control. A bipolar voltage, proportional to the error between actual and desired temperature signals, appears at a rear panel connector. This voltage, fed to furnace controls, maintains the optimum steel surface temperature.



MEASURE DURING MOTION: Radiation thermometers, located below a tinplate annealing furnace, remotely measure the temperature of moving steel strip at several positions within the coating section.

HAPPY LATHE SALESMAN:
"This new 50" LeBlond sold for more than $100,000!"
O. W. "DOC" SHULL, Sales Engineer
Technical Equipment Sales Co.
LeBlond Indianapolis Distributors
HAPPY LATHE BUYER:
"We figure our new LeBlond will pay for itself in 3½ years!"
R. O. BERTSCH, Vice President
Bertsch & Co.
Cambridge City, Ind.
SALES MESSAGE:
Having a new LeBlond is a lot better than having the cash. Where else could you get a 30% per annum return on a blue chip* investment? Where else but at your LeBlond Distributor's. See him today!
*LeBlond's lasting value is acknowledged everywhere.
THE R. K. LeBLOND MACHINE TOOL COMPANY
Cincinnati 8, Ohio
LeBLOND of Cincinnati

Yoder Rotary Slitters reduce inventory... speed production

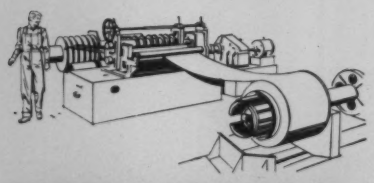
To help meet the demands of tight production schedules, YODER Slitters reduce mill-width stock quickly and economically to desired widths. If your needs are as low as 100 tons per month, time and manpower savings alone will offset the cost of your YODER Slitter in a matter of months, while reducing basic inventories. Compactly designed, standard YODER Slitters are built to handle standard coil widths... completely engineered lines for special requirements.

YODER accessories, such as coil cars, swivel unloaders, scrap choppers, scrap disposers, plate levelers and coil boxes, make stock handling fast and easy.

YODER also makes a complete line of Cold Roll-Forming equipment and Pipe and Tube Mills. To profit from YODER'S years of engineering and service experience, contact your local YODER representative or send for the YODER Slitter Manual.

Investigate the many advantages of YODER-engineered Slitter Installations. Write today for this comprehensive, 80 page YODER Slitter Manual... it's yours for the asking!

THE YODER COMPANY
5510 Walworth Avenue • Cleveland 1, Ohio



ENGINEERING YODER MANUFACTURING ROTARY SLITTING LINES

PATENT REVIEW

New Patents In Metalworking

Casting Ingots

Method of casting ingots, R. E. Kramig, Jr., Nov. 24, 1959. In the casting of steel ingots, a densely compacted, resin-bonded, asbestos fiber smirch plate is placed on the surface of the stool, and the ingot mold positioned so as to enclose the plate. During the pour, the plate prevents cratering of the stool and adhesion of the ingot metal thereto. No. 2,913,788.

Strip Processing

Strip processing mechanism, J. C. Bongiovanni (assigned to The Osborn Mfg. Co., Cleveland, O.), Nov. 24, 1959. Process regularizes and surface beneficiates steel strip, sheet, and the like. The scale is fractured by being subjected to both tension and compression strains. No. 2,913,809.

Ore Treatment

Process for treating ore, A. R. Stargardter (assigned to Washington Steel Corp., Washington, Pa.), Nov. 24, 1959. Process produces, directly from Cuban-type serpentine ores, a chrome-nickel stainless steel devoid of "tramp metals" and undesirable constituents. The ore is smelted, treated in a Bessemer converter, and then mixed with ferrochrome in an electric furnace. No. 2,914,396.

Machinable Steel

Wrought machinable tool steels, G. A. Roberts (assigned to Vanadium-Alloy Steel Co., Latrobe, Pa.), Nov. 24, 1959. A free-machining wrought steel comprises 0.1-1-pct PbS, 0.7-1.5-pct C, up to 18-pct W, about 4-pct Cr, 1-5-pct V, up to 8-pct each of Mo and Co, and the balance Fe. The PbS, for instance galena, has a desirable high melting point and a specific gravity approximately the same as steel. No. 2,914,400.

Alloy Steel

Alloy steel, P. Payson (assigned to Crucible Steel Co. of America, Pittsburgh, Pa.), Nov. 24, 1959. A low-cost alloy steel, which can be air cooled from an austenizing temperature to form martensite, consists of 0.6-0.7-pct C, 0.9-1.2-pct Mn, 1.4-1.8-pct Si, 1.3-1.9-pct Cr, 0.6-1-pct Mo, and the balance Fe and incidental impurities. No. 2,914,401.

"Patent Review" appears in the third issue of The IRON AGE each month. Look for it in the February 18 issue.

Sheet Metal Hot Top

Sheet metal hot top and method of using exothermic material in pouring ingots, W. M. Farnsworth and J. H. Kennedy (assigned to Republic Steel Corp., Cleveland, O.), Nov. 24, 1959. In the casting of steel ingots, a mass of exothermic material is maintained in the upper part of the mold, out of contact with, but in heat conductive relationship to the metal. Consequently, the steel is maintained in a molten state after the ingot has

been poured, and during solidification and shrinking of the ingot. No. 2,913,786.

Refining Pig Iron

Refining molten pig iron, D. C. Hilty (assigned to Union Carbide Corp., a corp. of N. Y.), Dec. 1, 1959. This method, lowering the silicon and carbon contents of pig iron, can be integrated into conventional steel making operations. Falling droplets of molten pig are subjected to the action of a rising stream of an oxidizing gas. No. 2,915,380.

Removal of Impurities

Process for removing sulfur and oxygen from metals, D. Goerrig and V. Lwowski (assigned to Farbenfabriken Bayer A. G., Leverkusen, Germany), Dec. 1, 1959. To remove sulfur and oxygen from pig iron, molten pig is treated with calcium monofluoride. No. 2,915,381.

Ore Beneficiation

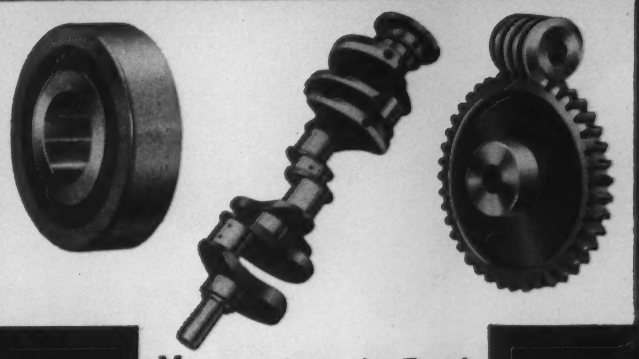
Ore beneficiation process and apparatus, P. L. Paull (assigned to Texaco Development Corp., New York, N. Y., Dec. 8, 1959. Method entrains and comminutes ores, e. g. taconite, hematite, etc., in turbulent vapors, whereby disintegration occurs largely along mineral interfaces, so that the finely ground material is readily separable into mineral-rich and mineral-poor fractions. No. 2,916,213.

Cladding Steel

Method for cladding steels of different compositions, J. B. Eagleston, Dec. 8, 1959. In the cladding of carbon steel with stainless steel, or monel metal, the sheets are positioned, air withdrawn from between them, and the pieces then welded together. No. 2,916,602.

Copies of U. S. Patents are available at 25¢ each from Commissioner of Patents, Washington 25, D. C.

VALVOLINE
Tectyl
protects metals
against RUST



VALVOLINE'S amazing Tectyl rust preventives protect metal surfaces against *every kind of rust and corrosion* during storage and shipping.

Low-cost Tectyl compounds are easy to apply by brush, spray or dip and just as easy to remove. They protect metal surfaces against . . . sun and rain . . . heat and cold . . . salt air and salt water . . . humidity, perspiration and corrosive fumes.

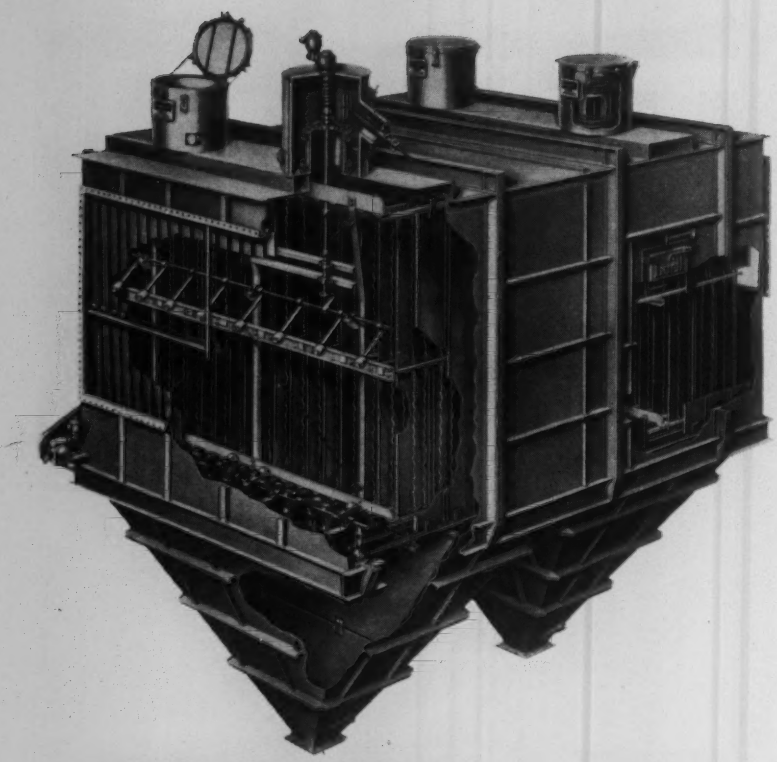
Tectyl rust preventives meet exacting government specifications.

Write today for these two helpful Tectyl charts

1. "Valvoline Tectyl U. S. Government Approved Packaging and Preservative Chart." Gives the Army, Navy and Air Force "Specs" and applications.

2. "Valvoline Tectyl Industrial Rust Preventive Comparison Chart." Specifies applications covering the entire field.

VALVOLINE
Tectyl
ALL-METAL PROTECTION
RUST PREVENTIVES



DECADE
OF OPERATION PROVES MAINTENANCE OF BUELL 'SF' PRECIPITATORS AVERAGE LESS THAN 2%

In 10 years of selling 'SF' electric precipitators, the number of replacement parts ordered from Buell has amounted to only 1.17% of the total sales! Even on emitting electrodes, usually the most vulnerable part of a precipitator, replacement has amounted to less than 1% of the original number installed. What do these extremely low percentages mean? Exceptionally low maintenance costs, for one thing, continuous high-efficiency operation, fewer shutdowns and process interruptions. Buell self-tensioned emitting Spiralectrodes eliminate vibration found in weight-tensioned wires. Buell's low maintenance precipitators will provide you with the most satisfactory operating results. They're backed by 25 years of experience in dust collection, with the practical know-how gained on hundreds of installations. Write for descriptive literature. The Buell Engineering Co., Inc., Dept. 42-A, 123 William St., N. Y. 38, N. Y. (Subsidiary: Ambuco Ltd, London, England)

buell®

EXPERTS AT DELIVERING EXTRA EFFICIENCY IN DUST RECOVERY SYSTEMS

FREE LITERATURE

Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, p. 103.

Acrylic-Type Polymer

A technical information brochure fully explains the mechanical, optical, and thermal properties of a thermoplastic resin, which can be utilized for injection molding and extrusion. The resin possesses a high craze and solvent resistance. (J. T. Baker Chemical Co.)

For free copy circle No. 1 on postcard, p. 103

Collets, Pushers, Cams

Complete information on collets, pushers, and cams is offered in a new 24-page catalog. This includes charts and engineering diagrams, along with illustrations showing the sizes and kinds of collets, pushers, and cams. (Modern Collet and Machine Co.)

For free copy circle No. 2 on postcard, p. 103

Seal-Less Pumps

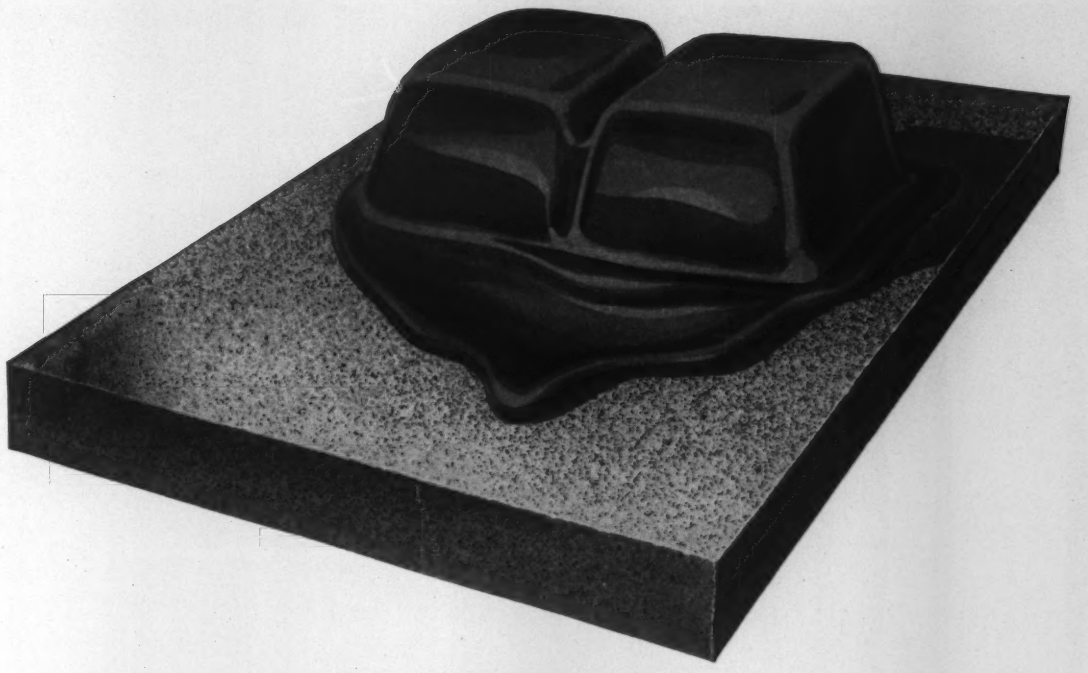
A new four-page bulletin describes a complete line of seal-less pumps for leak-proof pumping. Also covered is the design, operation, and selection of the proper "canned" pump. (Chempump Div., Fostoria Corp.)

For free copy circle No. 3 on postcard, p. 103

Soft-Faced Hammers

An entire line of soft-faced hammers for industrial use is contained in a short, full-color booklet. Illustrations and descriptions of plastic hammers with or without replaceable screw-on plastic tips, a "no-bounce" hammer, babbitt hammers, and tamper drifts are included. (Metocraft Alloy & Plastic Co.)

For free copy circle No. 4 on postcard, p. 103



The refractory aluminum can't lick!

...CRYSTOLON* Silicon Carbide

Impact on a charging hearth . . . a surge of molten metal into a trough . . . attack by corrosive alloys, fluxes and slags . . . Norton CRYSTOLON Refractories stand up to *all* these rigors of aluminum melting and transfer operations. Their exceptional stamina and stability not only protect purity throughout critical processing but also sharply reduce refractory maintenance.

Small wonder. CRYSTOLON Refractories are the most resistant to corrosion and erosion of all known refractories — and they offer outstanding mechanical strength and the highest resistance to thermal shock.

Ideal for use at all key melting, holding and transfer points, CRYSTOLON Refractories are specifically recommended for reverberatory and induction type furnaces. On the melting hearth, in the hot wall, in the holding hearth, and in many other critical areas, they assure longer refractory life . . . cleaner metal, free from refractory inclusions. What's more, CRYSTOLON Refractories are not wet under these corrosive conditions. Refractory surfaces stay clean longer . . . last longer.

Use these versatile refractories wherever aluminum could cause costly trouble . . . wherever contamination is a threat: in melting areas, launders, spouts and simple valves . . . for tap blocks and stopper rods. Take full advantage of today's high purity pig . . . *protect* purity during *your* operations. Reduce your reject losses with Norton CRYSTOLON Refractories. Several types are available to meet your precise requirements: oxide-bonded CRYSTOLON "G"; nitride-bonded CRYSTOLON "N" and recrystallized CRYSTOLON "R" Silicon Carbide. For complete details, write NORTON COMPANY, Refractories Division, 200 New Bond Street, Worcester 6, Mass.

NORTON PRODUCTS

Abrasives • Grinding Wheels • Grinding Machines
Refractories • Electrochemicals

BEHR-MANNING DIVISION

Coated Abrasives • Sharpening Stones
Pressure-Sensitive Tapes

*Trade-Mark Reg. U. S. Pat. Off. and Foreign Countries

NORTON

REFRACTORIES

Engineered... Rx ...Prescribed

Making better products . . . to make your products better

Flash butt-welded ring from extruded material slashes away 64 lbs. of stainless 310

Only 1/3 as much material was required when a special extruded section was substituted for bulky bar stock in this flash butt-welded ring. By leaving 2/3 of the material at the mill, instead of hogging it out, Amweld saved its customer $76.83 per ring—plus hours of expensive machining. (Savings compared to the forgings originally used are even greater.)

Amweld is equipped to supply flash butt-welded rings and circular products in stainless, titanium, aluminum, as well as a wide variety of corrosion-resistant alloys. If you would like to know more about Amweld's welding, fabricating and complete machining facilities, phone or write.

GET THE FACTS ABOUT AMWELD

New 20-page catalog describes flash butt-welded rings and circular products manufactured by Amweld. Also booklet entitled, "How Flash Butt-Welded Rings are Made."

AMWELD® INDUSTRIAL PRODUCTS

THE AMERICAN WELDING & MFG. CO. • 120 DIETZ ROAD • WARREN, OHIO

FREE LITERATURE

Continued

These publications describe money-saving equipment and services . . . they are free with no obligation . . . just circle the number and mail the postcard.

Conversion Chart

A conversion chart lists identical jig and fixture components manufactured by ten different companies. Consequently, it is an invaluable aid for bulking orders. (Northwestern Tools, Inc.)

For free copy circle No. 5 on postcard

Welding Symbols

A bulletin contains charts and illustrations on the application of welding symbols and basic design data on welds. It includes recent revisions of standard welding symbols. (Lincoln Electric Co.)

For free copy circle No. 6 on postcard

Heat Treating

A discussion of temperature uniformity and furnace design in heat treating is available in an eight-page booklet. Also contained are graphs illustrating test results and a discourse on controlled forced convection heating and temperature uniformity. (Ipsen Industries, Inc.)

For free copy circle No. 7 on postcard

Welding Method

Information, describing equipment used for automatically welding girth seams on tanks, is available in a four-page folder. Doubling as an instruction sheet, it also contains a table on edge preparation and current required. (Arcos Corp.)

For free copy circle No. 8 on postcard

Marine Gears

Engineering and production facilities, along with quality control and testing procedures are fully illustrated in a six-page folder. Additional information includes the features common to all the marine gears, followed-up by a special section concerning parts and service facilities. (Twin Disc Clutch Co.)

For free copy circle No. 9 on postcard

Bus Ducts

An 11-page booklet, pertaining to a new high-frequency bus duct, outlines bus duct features accompanied by a curve of voltage drop at 400 cycles per second plotted against load. (Westinghouse Electric Corp.)

For free copy circle No. 10 on postcard

Alloy Castings

A convenient guide to the selection and use of high alloy castings is available in a new 20-page bulletin. Covering static, centrifugal, and shell molded castings, it also includes technical data concerning the physical properties of high alloy castings plus standard designation and stress temperature curves for selected high alloys. (Duraloy Co.)

For free copy circle No. 11 on postcard

Mechanical Tubing

Two general purpose steels available in tube form, and standardized as to selection and stocking for each application, are discussed in a folder. The general characteristics and technical data concerning these two grades of steel are also included in the folder. (Babcock & Wilcox Co.)

For free copy circle No. 12 on postcard

Multi-Pointer Gage

The description and illustration of multi-pointer gage units is presented in a new, four-page product specification. The gage units are employed as pressure and level measurers and pneumatic transmitters or receivers. (Bailey Meter Co.)

For free copy circle No. 13 on postcard

Sampling Device

Complete information on a new sampling device of invaluable aid in the chemical analysis of metals, is attainable in booklet form. The

Postcard valid 8 weeks only. After that use own letterhead fully describing item wanted. **1/21/60**

Circle numbers for Free Technical Literature, Design Digest, or New Equipment:

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90

If you want more details on products advertised in this issue fill in below:

Page ..... Product .....

Page ..... Product .....

Page ..... Product .....

INVALID WITHOUT COMPANY NAME—TYPE OR PRINT

Name .....

Title .....

Product Manufactured .....

Company .....

Co. Address .....

.....

City ..... Zone .... State .....

FIRST CLASS
PERMIT No. 36
NEW YORK, N. Y.

BUSINESS REPLY CARD
No postage necessary if mailed in the United States

POSTAGE WILL BE PAID BY

THE IRON AGE
Post Office Box 77, Village Station
NEW YORK 14, N. Y.

BUSINESS REPLY CARD
No postage necessary if mailed in the United States

FIRST CLASS
PERMIT No. 36
NEW YORK, N. Y.

POSTAGE WILL BE PAID BY

THE IRON AGE

Post Office Box 77, Village Station

NEW YORK 14, N. Y.

Postcard valid 8 weeks only. After that use own letterhead fully describing item wanted. 1/21/60

Circle numbers for Free Technical Literature, Design Digest, or New Equipment:

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90

If you want more details on products advertised in this issue fill in below:

Page ..... Product .....

Page ..... Product .....

Page ..... Product .....

INVALID WITHOUT COMPANY NAME—TYPE OR PRINT

Name .....

Title .....

Product Manufactured .....

Company .....

Co. Address .....

.....

City ..... Zone .... State .....

FREE LITERATURE

tool's operation yields a pin sample from solid material. The resulting samples provide sharply defined determinations. (Laboratory Equipment Corp.)

For free copy circle No. 14 on postcard

Geared Belting

The combination—flexibility of belt drives with advantages of chain and gear drives—produces an accurately constructed belt described fully in a 56-page catalog. The catalog also contains specifications, design and installation suggestion, engineering data, and tables of stock drive combinations. (Browning Mfg. Co.)

For free copy circle No. 15 on postcard

Copper Alloy

The physical, mechanical and fabrication properties of tellurium copper are presented in a new technical data sheet. The alloy is primarily used in rod form for screw machine work; it is also employed in torch tips for oxyacetylene assemblies and in applications where high electrical conductivity is needed. (Bridgeport Brass Co.)

For free copy circle No. 16 on postcard

Maintenance Ideas

Numerous maintenance ideas are presented in a short bulletin. In addition, a lubricant list is provided. (Kano Laboratories)

For free copy circle No. 17 on postcard

Eliminate Dust

A tablet duster combines static eliminators, air and vibration to remove dust. Elimination of dust is reported to be 400 pct more effective than with previous dusters. (Pharmaceutical Equipment Div., F. J. Stokes Corp.)

For free copy circle No. 18 on postcard

Control Temperatures

Information on the measurement and control of industrial temperatures fills a 23-page booklet. Charts, drawings, diagrams and case histories help to point out that "degrees" cost dollars. (Partlow Corp.)

For free copy circle No. 19 on postcard

Molybdenum Alloys

A publication provides convenient, condensed data and selected references on binary and more complex diagrams pertaining to molybdenum. (Climax Molybdenum Co., Div. of American Metal Climax, Inc.)

For free copy circle No. 20 on postcard

Prevent Rust

Highlight of a handy manual is the new color system that stops rust and provides lasting beauty in a system of specially formulated primers and colorful top coatings. A foldout displays 67 actual color standards. (Rust-Oleum Corp.)

For free copy circle No. 21 on postcard

Process Timers

Timers for control of repeating cycles are described in a four-page bulletin. Application descriptions, ratings, dimensions, prices and ordering directions are included. (General Electric Co.)

For free copy circle No. 22 on postcard

Air Processing

Data on such equipment as ovens, dryers, air heaters and curing systems appear in a 12-page bulletin. Specific case histories on tough drying and curing problems solved by properly engineered equipment are featured. (J. O. Ross Engineering, Div. of Midland-Ross Corp.)

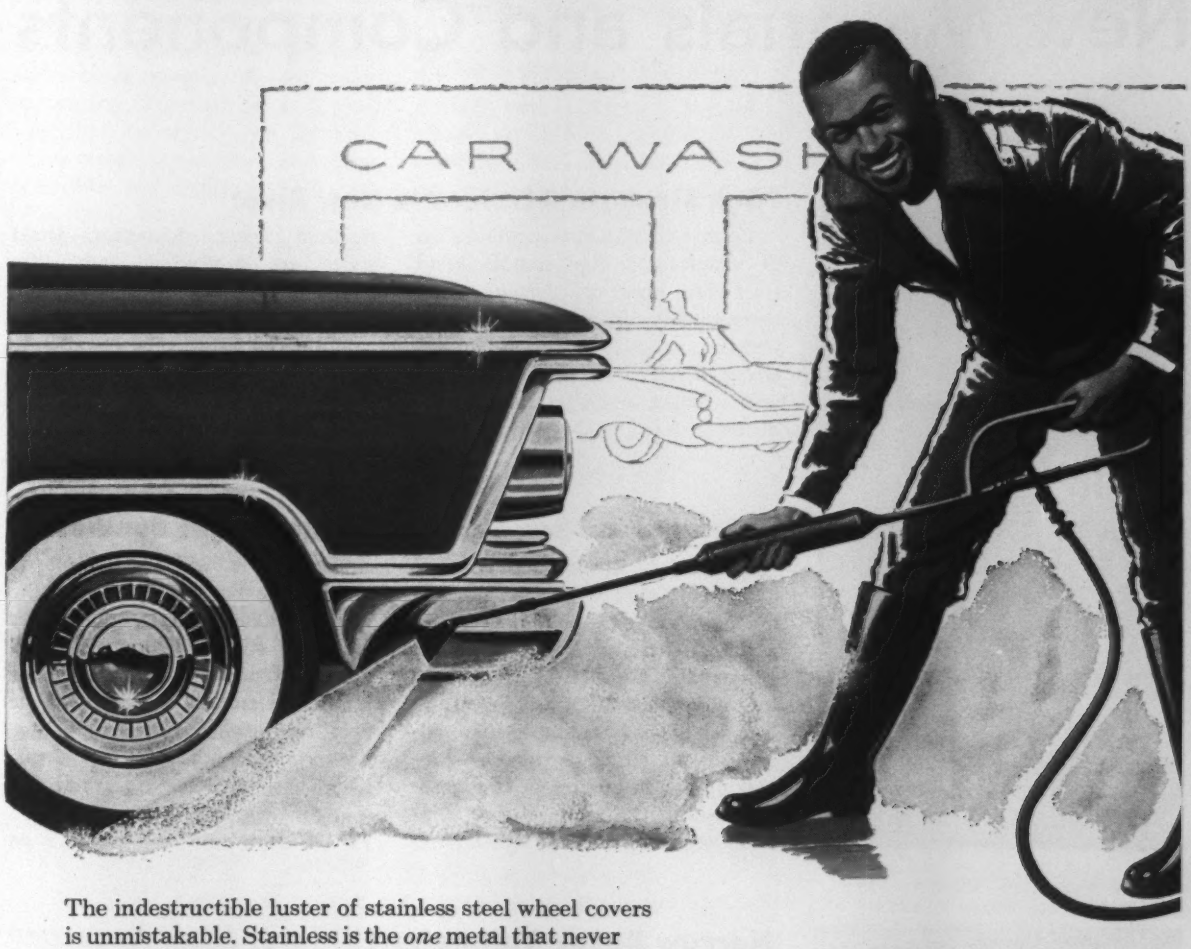
For free copy circle No. 23 on postcard

Inflated Sanding Drum

An inflated sanding drum, for use with coated abrasive bands, is designed for application on floor-mounted machinery in the metalworking, shoe manufacturing and woodworking industries. The inflated drum, 8-in. diam by 9 in. wide, is leak-proof and requires no adhesive to fasten the drum to the core. (NuMatic Grinders, Inc.)

For free copy circle No. 24 on postcard

"Man...that Stainless Shines!"



The indestructible luster of stainless steel wheel covers is unmistakable. Stainless is the *one* metal that never betrays a car's mileage . . . or age. The highway's abrasive grit, winter's salted streets, and even harsh detergents and steam can't corrode, etch or dim its beauty.

High quality Uniloy Stainless Steel, now being produced in one of the world's most modern mills, is rolled to your exact specifications. Specify Uniloy Stainless Steel for automotive trim that stays showroom new—forms and fabricates to the designers will.

UNILOY
STAINLESS STEELS

UNIVERSAL CYCLOPS
UC STEEL
STEEL CORPORATION
BRIDGEVILLE, PA.

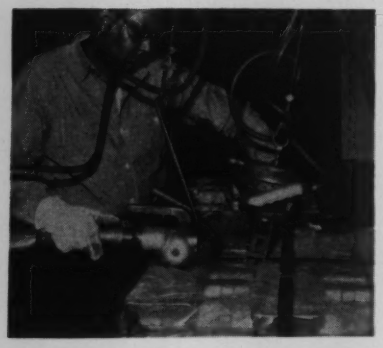
STAINLESS STEELS • TOOL STEELS • HIGH TEMPERATURE METALS

New Materials and Components

High Strength Attained in New Rivet

Composed of a new combination of materials, a lock-spindle blind rivet gives improved strength at all temperatures up to 1000°F. The fastener, consisting of a monel sleeve, a pin of stainless steel alloy, and a monel locking collar, is produced in ⅛-, 5/32-, and 3/16-in. nominal sleeve diameters. Head styles are protruding and 100° countersunk. During installation, the extra length of pin is automatically broken off, thereby eliminating secondary trimming. (Huck Mfg. Co.)

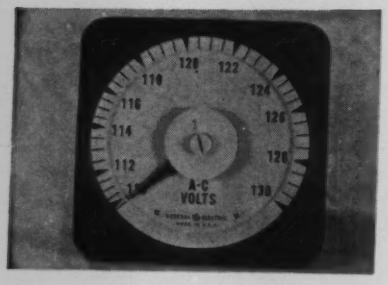
For more data circle No. 25 on postcard, p. 103



Polyethylene Bag Encases Pig and Ingot Bundles

Delivery of clean aluminum pig and ingot bundles to customers is made possible through the use of a polyethylene bag encasing the ingot bundle. The plastic wrap keeps the aluminum dirt and moisture free, and has been designed to allow air to circulate, thereby preventing the formation of condensation within the wrap during shipment or storage of the metal. Steel straps, 1¾ in. wide, are employed to hold the bag snugly around the bundle. Consequently, customers are then able to store the metal outdoors, thus eliminating the need for indoor storage space. Complete field testing has proven that the plastic wrap withstands all normal transportation hazards. (Kaiser Aluminum & Chemical Corp.)

For more data circle No. 26 on postcard, p. 103



Narrow Range Voltmeter Features High Accuracy

An ac voltmeter, calibrated from 110 to 130 v, offers improved readability and increased accuracy. Dial calibrations in ½ v intervals, and nearly linear spacing throughout the full scale, permits fast, accurate readings. The meter's accuracy, increased from 0.5 to 0.3 pct of mid-scale value, gives readings within ± 0.36 v. The 110-130 v are spread over 95 pct of the instrument's scale length. The voltmeter is available for 50/60 and 400 cycle duty. (General Electric Co.)

For more data circle No. 27 on postcard, p. 103

Corrosion-Resistant Tape Protects Pipe Joints

Corrosion-resistant tape, used for wrapping joints of plastic-coated steel pipe, furnishes protection to exposed ends of pipe. The tape resists moisture, acids, alkalies, salt, and stray currents. The opaque yellow color of the tape reflects heat; the tape offers an insulation value over 500,000 megohms and has a dielectric strength to 15,000 v. Available in 1-, 2-, and 4-in. width, each roll is 100-ft long. (Republic Steel Corp.)

For more data circle No. 28 on postcard, p. 103

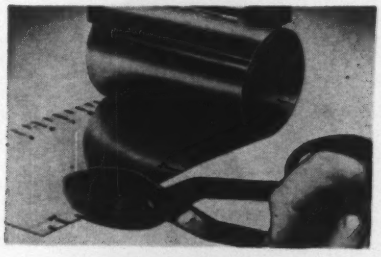
Rust Preventive

A new low-cost oxidation and rust preventive and inhibitor for all metals is a combination of chemicals dispersed in an oil base which gives it deep penetrating qualities, and which can be applied by either spray, brush, mop, or dipping. Low in viscosity, it will not settle. It prevents rust by sealing out the elements which cause rust, and also penetrates and disperses those rust formations which may have accumulated on the metal. It is particularly useful on new metal or fabricated parts ready for shipment. Readily removable by steam or with a number of standard solvents, it can be painted over without further treatment. (Brad Chemical, Inc.)

For more data circle No. 29 on postcard, p. 103

Calibrated Shim Stock

Stainless steel shim stock, calibrated in ½- and 1-in. increments throughout its 60 in. length, insures economical usage of material, and automatically maintains a stock inventory count. The pre-measured edge shows the number of inches



remaining, after the required size is cut. The calibrated coils are available in nine standard sizes from 0.002- to 0.010-in. material thickness. (N. E. Slavin & Co.)

For more data circle No. 30 on postcard, p. 103

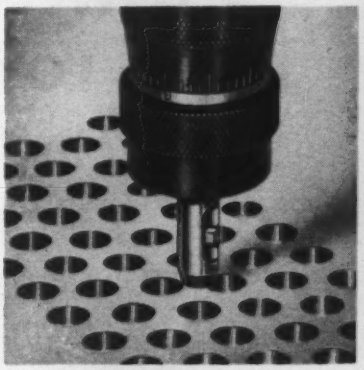
Collet Actuator

A non-rotating collect actuator automatically opens and closes chucks and collets, and provides dependable holding power for bar or chucking work. Clamping forces are transmitted through the actuator itself rather than through the machine spindle guide bearings, thus eliminating substantial wear from the spindle bearings. It can function automatically, without an operator in attendance. Simple insertion of an adapter changes a machine from collet to chuck operation without removing the actuator. (Acme Industrial Co.)

For more data circle No. 31 on postcard, p. 103

Tube Swaging Method

High heat exchanger pressures, already at 5000 psi and expected to climb to 7000 psi, have dictated new ways of joining heat exchanger tubing to flanges, housing and other solid structures. Latest technique is to employ grooved locating holes,



into which the heat exchanger tubes are swaged. A spring-loaded cutting tool, mounted in a spindle of a programmed drilling machine, produces a groove in each hole automatically. Many of the tube sheets contain from 2000 to 3000 holes. (Ross Heat Exchanger Co.)

For more data circle No. 32 on postcard, p. 103

Damageproof Tires

Composed of fabric parts vertically laminated and banded together with rubber and an internal steel band, tires for industrial trucks are absolutely flatfree in work over all sorts of normally destructive objects. They also offer a soft ride. They are specified as optional original equipment by most material-handling manufacturers. (NOTAT Tire Co.)

For more data circle No. 33 on postcard, p. 103

Fluid Prevents Arcing

Silicone fluid, available in collapsible metal tubes for industrial use in sealing electrical connections, prevents arcing, flash-over or short

"the HITCHINER way..."

saves 35 MACHINING OPERATIONS with INVESTMENT CASTING

This barrel of a .22 caliber target revolver is now being cast by Hitchiner's new ceramic shell process. This new investment casting technique provides sufficient close tolerances and finishes to eliminate the need for 35 machining operations. Gun barrel tolerance of 0.006 inch was normal, but plus over minus 0.001 inch was maintained on certain areas. Only external finishing needed was partial polishing.

These savings have allowed the manufacturer of this revolver to sell it for considerably less than a similar previous model.

Through investment casting, parts can be designed for function and maximum operating efficiency with the widest selection of alloys from which to choose. This freedom from manufacturing problems can result in more flexibility in design and less waste in production.

Send us a sample or blueprint and check your specific problem with our "engineered quotation" — no obligation, of course.

Find out how our new ceramic shell technique can possibly benefit you. Send for our free, new revised brochure explaining investment castings.

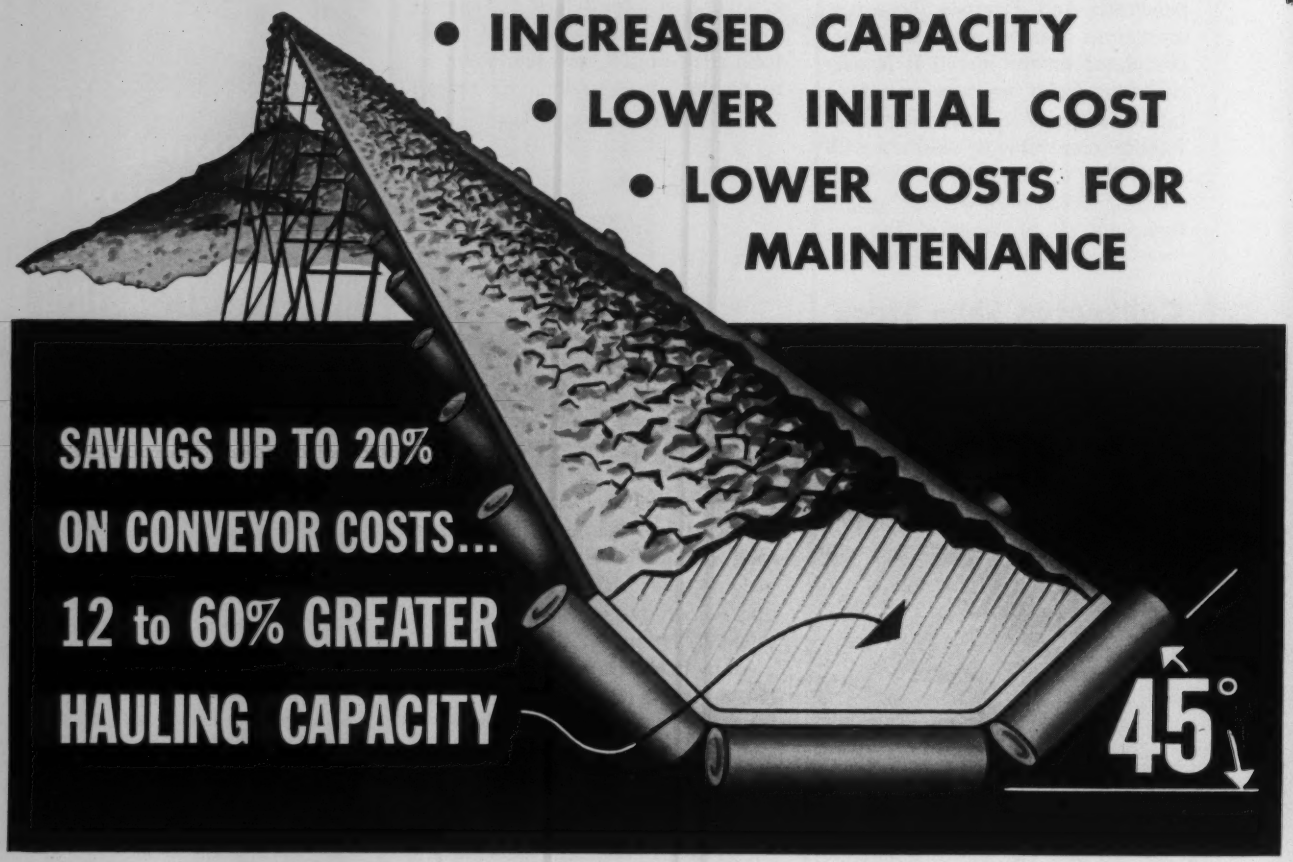
HITCHINER
MANUFACTURING COMPANY INC.
MILFORD 36, NEW HAMPSHIRE

Coast to Coast Engineering Representatives

MOST IMPORTANT NEWS

NOW YOU CAN USE 45° IDLERS

- INCREASED CAPACITY
- LOWER INITIAL COST
- LOWER COSTS FOR MAINTENANCE



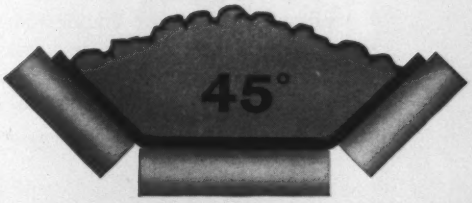
It's a mathematical certainty that a belt can haul bigger loads with 45° idlers than with regular 20° idlers. But the 45° angle between concentrating idlers and bottom roll idlers is too sharp for an ordinary heavy duty conveyor belt. Plies separate, but modern RAY-MAN CONVEYOR BELT licks this problem . . . for all time!

Ray-Man's exclusive flexible construction and built-in stress compensation is guaranteed to take the sharp angle of 45° idlers without ply or cover separation at the hinge line. This opens a whole new era of conveyor design . . . permitting larger loads . . . narrower conveyors . . . assuring longer cover wear . . . lower handling costs!

RAY-MAN GIVES YOU "*MORE USE PER DOLLAR*" WITH 45° IDLERS

IN CONVEYING TODAY!

...TO HANDLE ALL MATERIALS

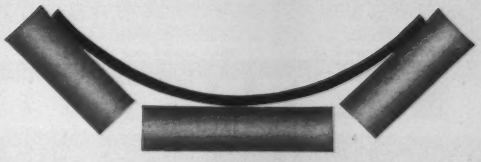


BIGGER LOADS, LESS SPILLAGE, LESS WEAR ON COVER WITH 45° IDLERS

20° IDLERS REQUIRE WIDER CONVEYOR TO HAUL SAME TONNAGE

Only RAY-MAN CONVEYOR BELT is BUILT to take the EXTRA STRESS OF 45° IDLERS

RAY-MAN IS GUARANTEED NOT TO PLY-SEPARATE AT 45° ANGLES



ORDINARY PLY BELTS ARE TOO BOARDY TO TAKE 45° ANGLES

Ask your R/M representative to show you how Ray-Man Conveyor Belt with 45° idlers can give you the most for your conveyor dollar ... write for new Bulletin M303, "Ray-Man for 45° Idlers."

RAYBESTOS-MANHATTAN, INC.
MANHATTAN RUBBER DIVISION, PASSAIC, NEW JERSEY

RM

RM-961
ENGINEERED RUBBER PRODUCTS ... MORE USE PER DOLLAR

HOW TO BEAT THE HEAT

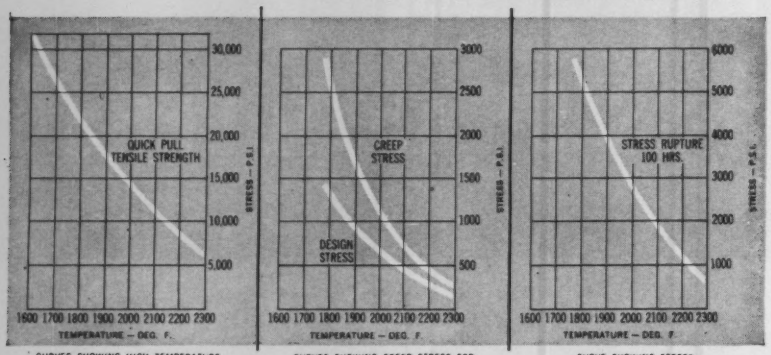
for strong high alloy requirements in the 1,800° to 2,300° F range!

DURALOY HOM*

*Covered by U.S. Patents

casting alloy

Duraloy "HOM" is a special high nickel alloy developed to produce castings that meet high temperature requirements, especially when castings are subject to oxidizing atmospheres.



CURVES SHOWING HIGH TEMPERATURE SHORT-TIME TENSILE STRENGTH OF DURALOY-HOM

CURVES SHOWING CREEP STRESS FOR CREEP RATE OF 1% IN 10,000 HOURS AND RECOMMENDED DESIGN STRESS FOR DURALOY-HOM

CURVE SHOWING STRESS TO RUPTURE AT 100 HOURS FOR DURALOY-HOM

Castings of DURALOY "HOM" are now being produced by our three methods: static, centrifugal and shell molded. Write today for additional information on this versatile new alloy.

The DURALOY Company

OFFICE AND PLANT: Scottdale, Pa.

EASTERN OFFICE: 12 East 41st Street, New York 17, N. Y.
ATLANTA OFFICE: 76—4th Street, N.W.
CHICAGO OFFICE: 332 South Michigan Avenue
DETROIT OFFICE: 23906 Woodward Avenue, Pleasant Ridge, Mich.

DESIGN DIGEST

circuits. Nongumming, non-melting and noncorrosive, the silicone compound adheres to most surfaces. It resists temperatures from —90° to 250°C. (Dow-Corning Corp.)

For more data circle No. 34 on postcard, p. 103

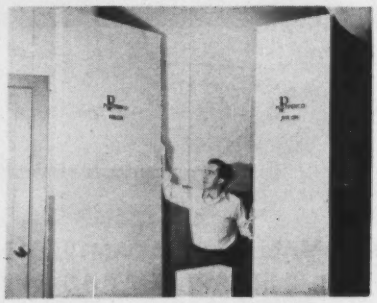
Pedestal Bearing

A self-aligning, pedestal type pillow block, with double-channel cross section, provides an economical and sturdy mounting for sleeve type bearing ball units. By eliminating the need for shimming or machined surfaces, the ball and socket combination for self alignment was added, so as to hasten assembly time. (Triangle Mfg. Co.)

For more data circle No. 35 on postcard, p. 103

Large Nylon Sections

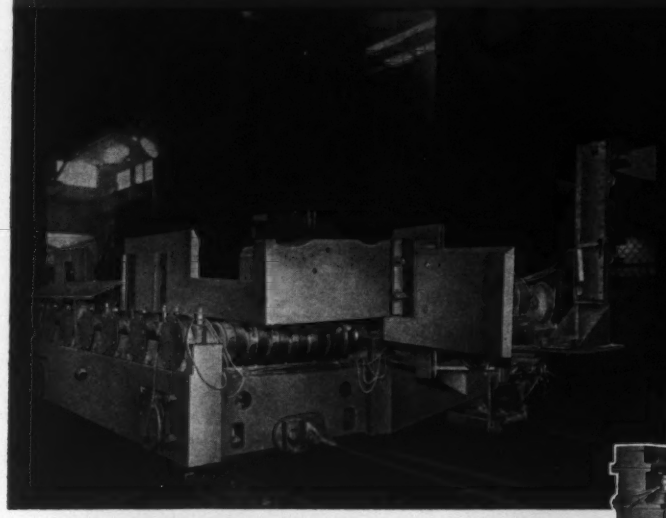
Newly developed, large nylon shapes are being produced in sections weighing up to 400 lb, measuring 36 in. in width, 2⅝ in. in thickness and 102 in. in length. The new shapes are expected to expand the use of nylon in the metalworking and manufacturing fields. Possible applications of the nylon sections are: tooling fixtures, wear plates, large rollers, and where



TREADWELL

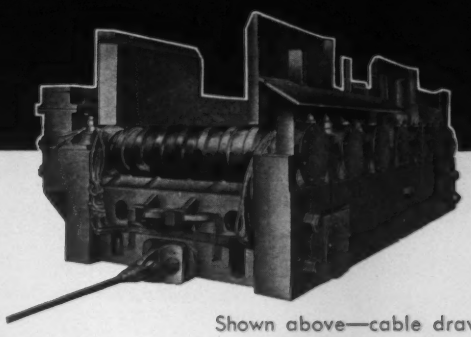
cable-drawn

table-top INGOT CARS handling two 15-ton ingots... at a speed of 800 ft. *per minute*



Treadwell engineering was called on to develop the speed and efficiency needed for handling heavy ingots at high rates of speed. This ingot car has table rollers that are carried by anti-friction bearings and the axles are anti-friction bearing mounted. Write to Treadwell for any information on ingot cars.

● The table rollers are driven by Cleveland worm and gear sets and a Farval system for lubricating all bearings is built into the car.



Shown above—cable drawn table top ingot car at work in a major steel plant.

TREADWELL

ENGINEERING COMPANY • INCORPORATED

SALES AND ENGINEERING OFFICES:

208 S. LA SALLE STREET
CHICAGO 4, ILL.
CEntral 6-9784

1015 FARMERS BANK BLDG.
PITTSBURGH 22, PA.
ATlantic 1-2883

Manipulators, Mill, etc.
Mills, Billet, Merchant & Bar
Mills, Rod
Special Machinery
Coilers & Reels

Conveyors, Coil
Drives & Pinions
Ejectors, Furnace
Gauges, Shear, Saw, etc.
Beds, Cooling,

Mills, Vertical Edging
Tables, Mill
Tables, Tilting & Lift
Tables, Transfer
Transfers

Beds, Inspection
Bumpers, Furnace
Pushers, Furnace
Repeaters
Handling Equipment (Kick-offs, Pilers, Cradles, etc.)

CASTINGS—Electric Furnace Steel, Ductile Iron, Gray Iron and Ni-Hard

nonferrous metals or stainless steel materials were previously used. (The Polymer Corp.)

For more data circle No. 36 on postcard, p. 103

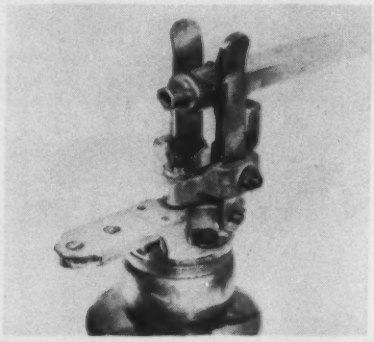
All-Purpose Oil

An all-purpose cutting and grinding oil contains a blend of saponifiables, sulphur and chlorine. It can be used as an additive to increase desirable characteristics of general purpose cutting oils. It can also be used straight from the can. (Shear-Speed Chemical Products)

For more data circle No. 37 on postcard, p. 103

Air Switch Contacts

A new process for manufacturing high-pressure solid silver-to-silver contacts eliminates corrosion under adverse atmospheric conditions. A special rolling procedure hardens coin silver harder than hard drawn copper. Previously, because of the inherent softness of silver, silver-to-silver contacts necessitated operating switches at relatively low pressures to prevent galling. Now, with the high-pressure solid silver to solid silver contacts, the silver possesses such hardness that it can take heavy wiping action. It also eliminates the use of contact shoes. (Federal Pacific Electric Co.)

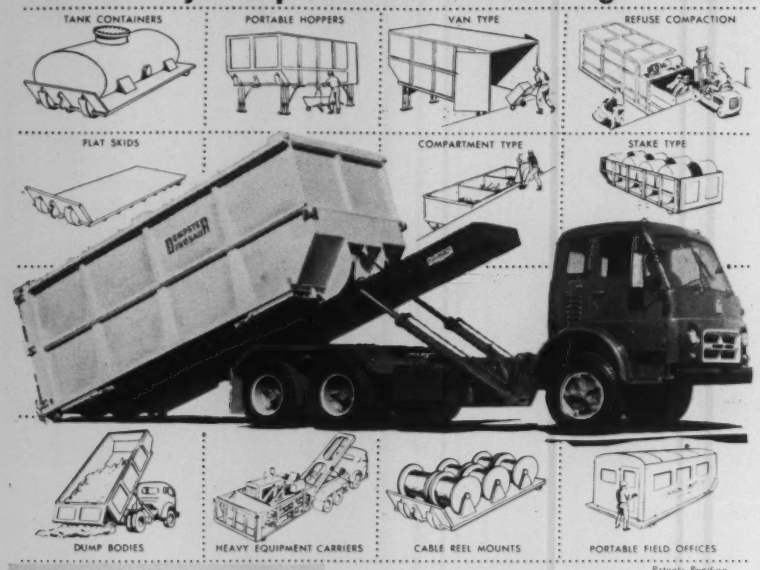


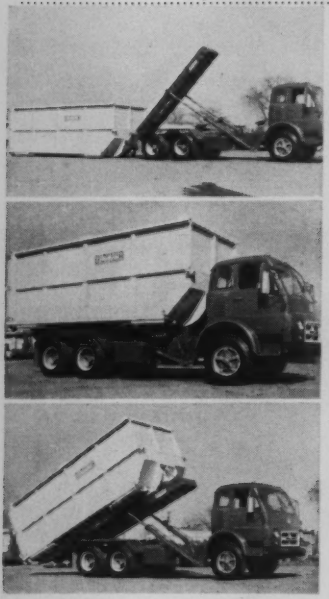
For more data circle No. 38 on postcard, p. 103

Tapping Attachment

Capable of producing millions of high-precision tapped holes under the most difficult field applications without service or repairs, a new attachment meets high torque and speed requirements. It will successfully handle the new fluteless taps as well as standards. Recommended maximum speed is 2000 rpm, at which speed it reverses at 3000 rpm. It has torque-control graduations based on tap breakage factor for determining proper torque. This virtually eliminates tap breakage, even in tapping blind holes. It is

One DINOSAUR With Detachable Containers . . . . Solves Many Complex Materials Handling Problems





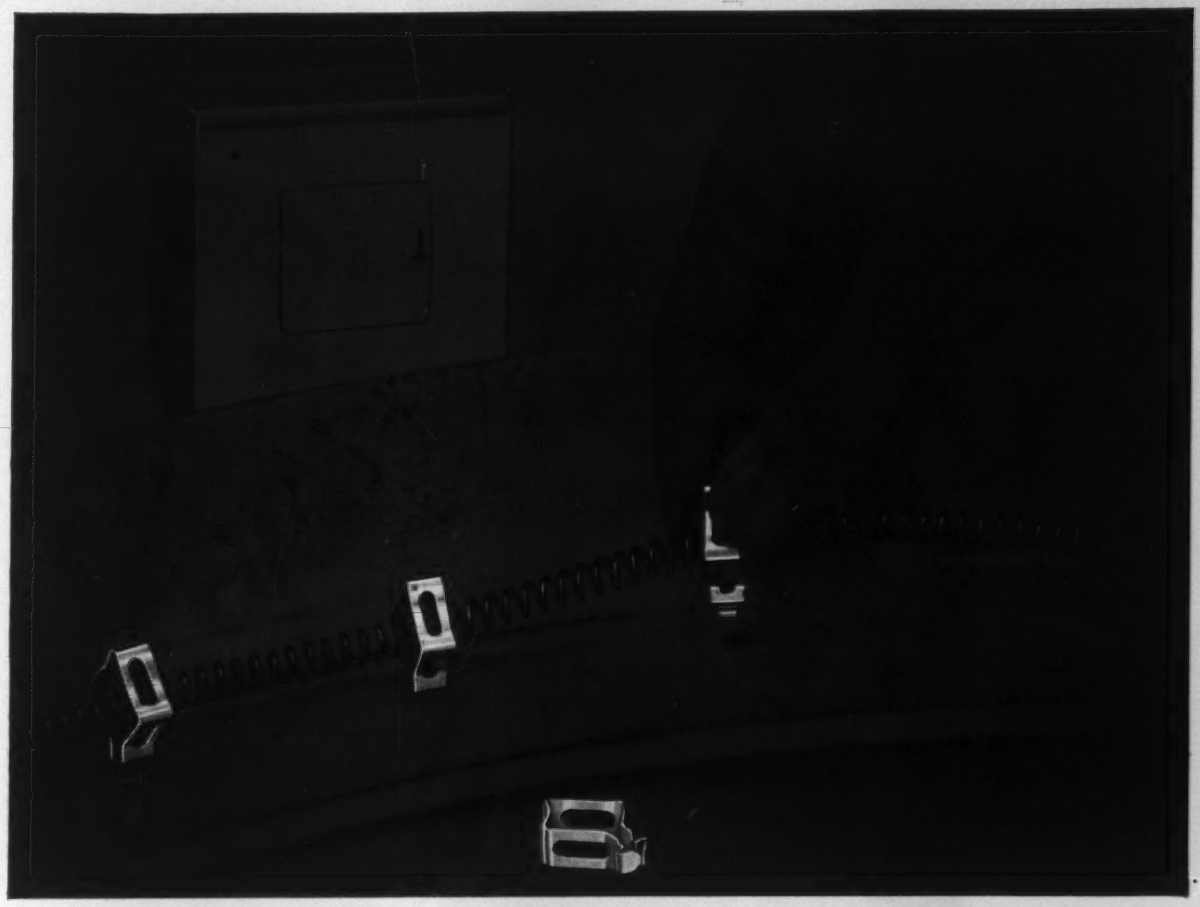
Here's the materials handling tool that takes up where the fork-lift truck leaves off. Gigantic loads can be placed on skids, in tanks or containers. The DEMPSTER-DINOSAUR picks them up . . . automatically . . . in seconds . . . and whisks them to their destination, in-plant or to over-the-road locations. Here they are put down, intact . . . pushed off on a dock . . . left on telescopic legs . . . or dumped.

One truck handles any number of containers of many types. Value of truck is multiplied . . . standing-idle time is eliminated . . . loading and handling is cut to the minimum. One man, the driver, handles the all-hydraulic operations without leaving the cab.

Containers available up to 40 cu. yds. and over . . . loads are limited only by the capacity of the truck. If you have a special problem send it in.

Write For Free Brochure

DEMPSTER BROTHERS
Inc.
KNOXVILLE 17, TENN., DEPT. IA-1



Engineered by Tinnerman . . .

SPEED CLIPS® reduce costs, simplify assembly and servicing on Maytag "Halo of Heat" Dryer

Clothes are dried efficiently in the famous Maytag "Halo of Heat" automatic dryer. And now the quality of the "Halo of Heat" dryer is even better than ever because its unique circular heating element is fastened quickly, securely by 22 special Tinnerman SPEED CLIPS developed by joint efforts of Tinnerman and Maytag designers.

Each one-piece SPEED CLIP eliminates a separate welding operation on the "Halo of Heat" assembly. Various screw-driving operations formerly required on Maytag's assembly line to capture the ceramic insulator and secure the mounting clamp were also eliminated, with equally interesting reductions in cost. Now, the stainless steel, vibration-proof fastener is snapped in place with simple "button-hook" action. No special skills or equipment are required. Assembly and parts costs have been reduced . . . *substantially!* Serviceability in the field has been improved.

A free Tinnerman Fastening Analysis of your own product can show you where similar assembly and cost-saving advantages are possible. Call your Tinnerman representative—he's listed in the Yellow Pages under "Fasteners". Or write to:

TINNERMAN PRODUCTS, INC.
Dept. 12 • P. O. Box 6688 • Cleveland 1, Ohio

TINNERMAN
Speed Nuts®

FASTEST THING IN FASTENINGS®

CANADA: Dominion Fasteners Ltd., Hamilton, Ontario. GREAT BRITAIN: Simmonds Aerocessories Ltd., Treforest, Wales. FRANCE: Simmonds S. A., 3 rue Salomon de Rothschild, Suresnes (Seine). GERMANY: Mecano-Bundy GmbH, Heidelberg.

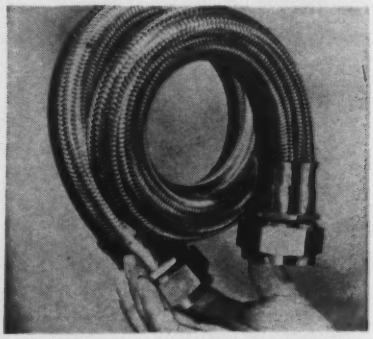
ideal for high-production or automated setups. It comes in sizes from #4 to 5/16-18. (Tapmatic Corp.)
For more data circle No. 39 on postcard, p. 103

Flip Grommets

A solid, one piece, nylon flip grommet can't shake loose or pop out. After insertion, it's flanged over. No heat is needed. Temperature range, depending upon hours of service, varies between —65° and 300°F. (Western Sky Industries)
For more data circle No. 40 on postcard, p. 103

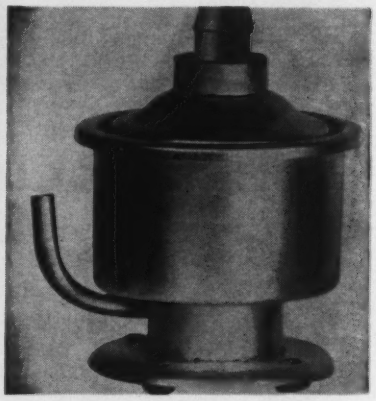
Flexible Hose

With a bend radius of about three times its inside diameter, a new flexible hose will operate at temperatures up to 400°F. It's available in inside diameters up to 2 in. Made of Teflon and stainless steel, the hose does not have an extruded inner core. Instead, unsintered Teflon tape and Teflon-impregnated fiber glass tape are wrapped and fed into a die which forms a laminated structure into helical convolutions. (Titeflex, Inc.)
For more data circle No. 41 on postcard, p. 103



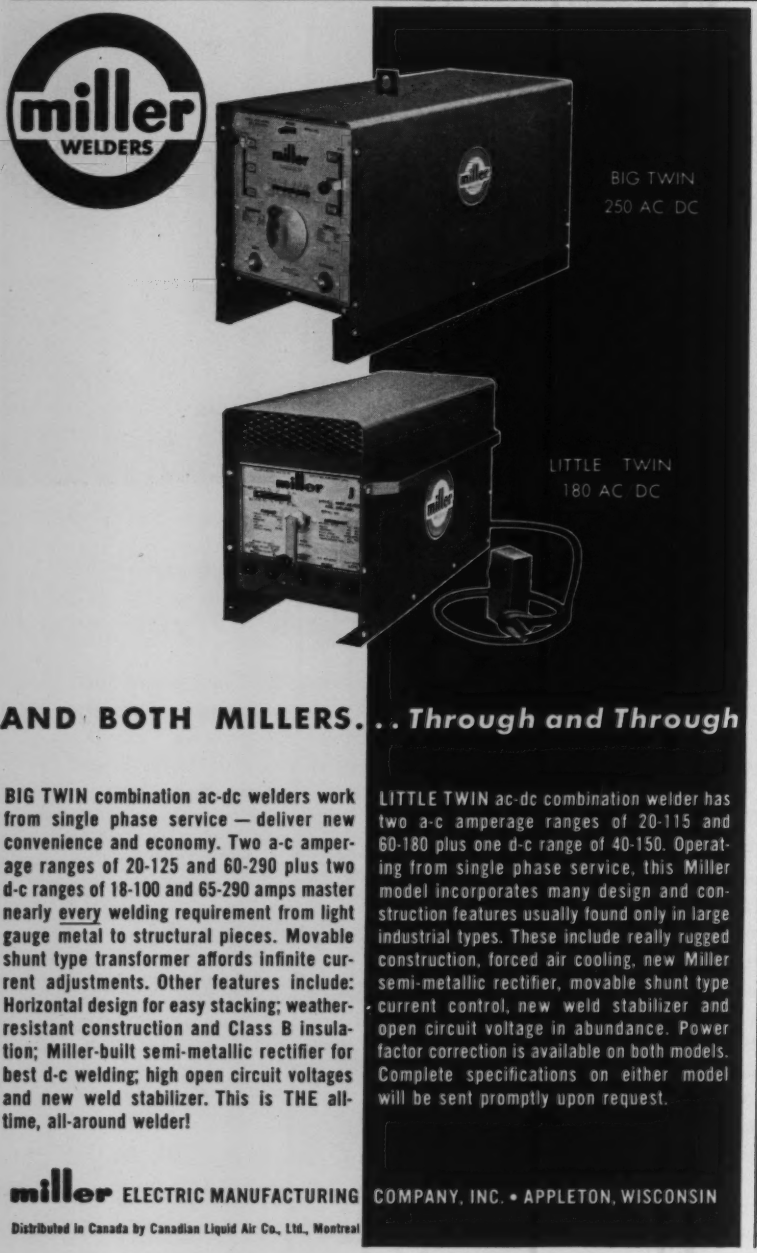
Coolant Pump

Designed to operate while fully or partially submerged, a line of small brass pumps works with lubricant fluids, machine tool coolants and a variety of other liquids. Made in three models with capacities ranging from 200 to 514 gph, the units are sealed in oil with fractional-horsepower high torque-low temperature motors. (Thomas Beckett & Co.)
For more data circle No. 42 on postcard, p. 103



Fluid Energy Mill

A 42-in.-diam fluid energy mill for grinding abrasive materials has a maximum capacity of 750 lb to over three tons per hour, depending on material and the fineness desired. With no moving parts, it causes micron-grinding particle col-



AND BOTH MILLERS... *Through and Through*

BIG TWIN combination ac-dc welders work from single phase service — deliver new convenience and economy. Two a-c amperage ranges of 20-125 and 60-290 plus two d-c ranges of 18-100 and 65-290 amps master nearly every welding requirement from light gauge metal to structural pieces. Movable shunt type transformer affords infinite current adjustments. Other features include: Horizontal design for easy stacking; weather-resistant construction and Class B insulation; Miller-built semi-metallic rectifier for best d-c welding; high open circuit voltages and new weld stabilizer. This is THE all-time, all-around welder!

LITTLE TWIN ac-dc combination welder has two a-c amperage ranges of 20-115 and 60-180 plus one d-c range of 40-150. Operating from single phase service, this Miller model incorporates many design and construction features usually found only in large industrial types. These include really rugged construction, forced air cooling, new Miller semi-metallic rectifier, movable shunt type current control, new weld stabilizer and open circuit voltage in abundance. Power factor correction is available on both models. Complete specifications on either model will be sent promptly upon request.

miller ELECTRIC MANUFACTURING COMPANY, INC. • APPLETON, WISCONSIN

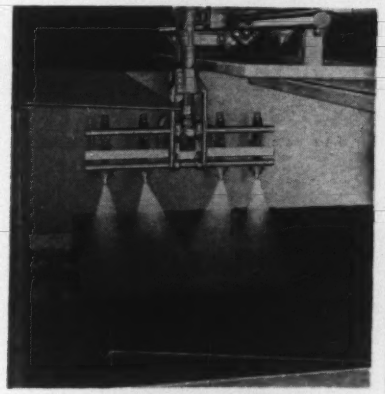
Distributed in Canada by Canadian Liquid Air Co., Ltd., Montreal

lision through jet action. It will be employed in the grinding of titanium dioxide to the unmeasurable micron and sub-micron range. (Sturtevant Mill Co.)

For more data circle No. 43 on postcard, p. 103

High-Strength Adhesive

A wide variety of porous and non-porous materials can be bonded together by a high strength, oil resistant, elastomeric base adhesive, developed for automatic spray application. The bonds produced by the industrial adhesive have high softening points, good resistance to



plastic flow, and a rapid rate of strength buildup. Some of the materials on which the adhesive produces high strength laminates are: plastic, thin-gage aluminum and steel, linoleum, leather, rubber, wood, and composition board. (Adhesive and Castings Div., Minnesota Mining & Mfg Co.)

For more data circle No. 44 on postcard, p. 103

Teflon "Spaghetti"

Spaghetti sleeving or slip-on insulation is available in Teflon, in sizes from No. 30 to No. 0 AWG, in almost all colors, for a broad range of uses in electrical and electronic components. It comes with ID from 0.010 to 0.330 in., with wall thickness from 0.004 to 0.020 in. The material won't melt or soften from contact with a soldering iron. It also stands up under overload currents. (Pennsylvania Fluorocarbon Co., Inc.

For more data circle No. 45 on postcard, p. 103

Far Ahead in Design and Efficiency

"YOUNGSTOWN"

CONTOUR ROLL LATHES

Automatic

"templet or numerically controlled" hydraulic or electric tracers assure fine finish and precision operation

Designed for a single purpose—roll turning. Choice of turning rolls in housings on the roll necks or using the heavy duty live centers provided in the headstock and tailstock.

"YOUNGSTOWN" engineering anticipates your future, as well as present productive position, in this quality line of Contour Roll Lathes.

PROVEN PERFORMANCE FEATURES:

- Heavy Duty roll lathe *rigidity*—with the *versatility* of the engine lathe
- Use of carbide, or ceramic tools provided by wide RPM range of headstock speeds
- 3-way bed for rigidity, with hardened and replaceable wear plates
- Anti-Friction Ball screws and nuts for longitudinal travel of carriage and cross-slide insuring precision tracing
- Operator travels with the work
- Heavy-Duty spring-loaded tail stock with load indicator—safeguards bearings
- Headstock has illuminated inspection ports, automatic lubrication, Timken roller bearings
- Housings—manually or hydraulically operated
- Electric-Hydraulic Ragging attachment optional
- Heavy Duty mill type construction. Herringbone gearing throughout.
- Faceplate overhang eliminated.

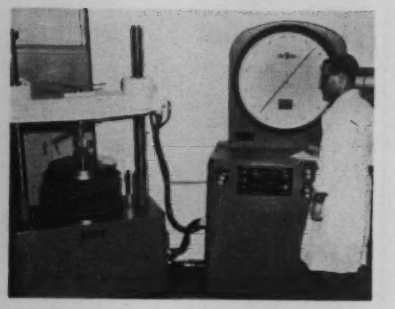
Write us to arrange a demonstration.

The Youngstown Foundry & Machine Co.

Serving Industry Since 1885

Youngstown 1, Ohio

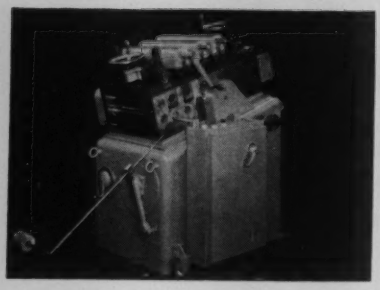
New Equipment and Machinery



Push-Pull Tester Features "Universal" Cycling

In addition to handling routine tests, a new line of hydraulic testing machines alternately applies tensile and compressive forces to the same test sample. Cold working and "Bauschinger effect" (inverse strain softening) relationships are automatically recorded as the sample is rapidly cycled. Applied forces range between preselected limits in tension, in compression, or in tension-compression reversal applications. A program controller, preset to determine the number of test cycles, maintains complete control of the equipment. (Tinius Olsen Testing Machine Co.)

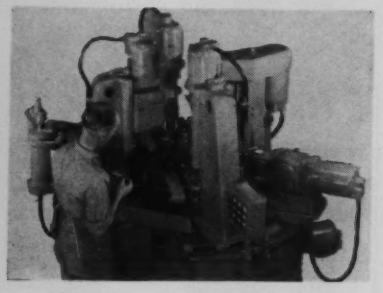
For more data circle No. 46 on postcard, p. 103



Power Straightener Removes Set from Coils

Handling materials up to 16-in. wide with a maximum thickness of ¼ in., a power-driven straightener removes coil set. The straightener is arranged with a pair of power-driven take-in rolls, six straightening rolls and a pair of take-out rolls. All rolls are hardened, ground and mounted in bronze bearings. Gear driven through an electric clutch, the unit has casters for portability. The straightener is used with automatic feeding equipment, press brakes or other fabricating machines. (U. S. Tool Co., Inc.)

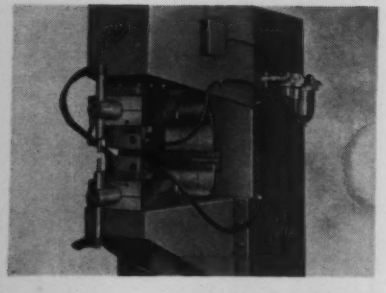
For more data circle No. 47 on postcard, p. 103



Multi-Unit Automatic Turns Out Switch-Gear

An indexing automatic unit drills, reams, chamfers and taps telephone switch-gears parts. It turns out 1200 parts per hour. The machine works on either a clamp or a pawl (switch-gear parts) by changing the locating blocks in the fixtures. An operator places the parts in the fixtures. Clamping is automatic by means of a sliding carrier bushing at each working station. Ejection is also automatic. Four vertical and two horizontal operations are handled simultaneously. (Kingsbury Machine Tool Corp.)

For more data circle No. 48 on postcard, p. 103



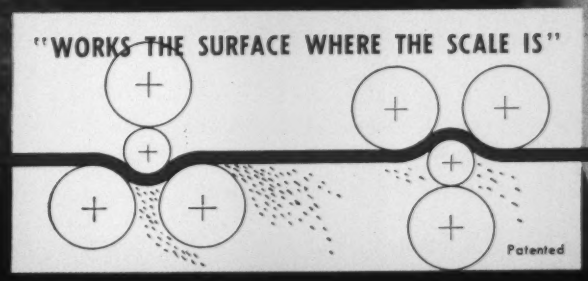
Machine Provides Spot and Projection Welding

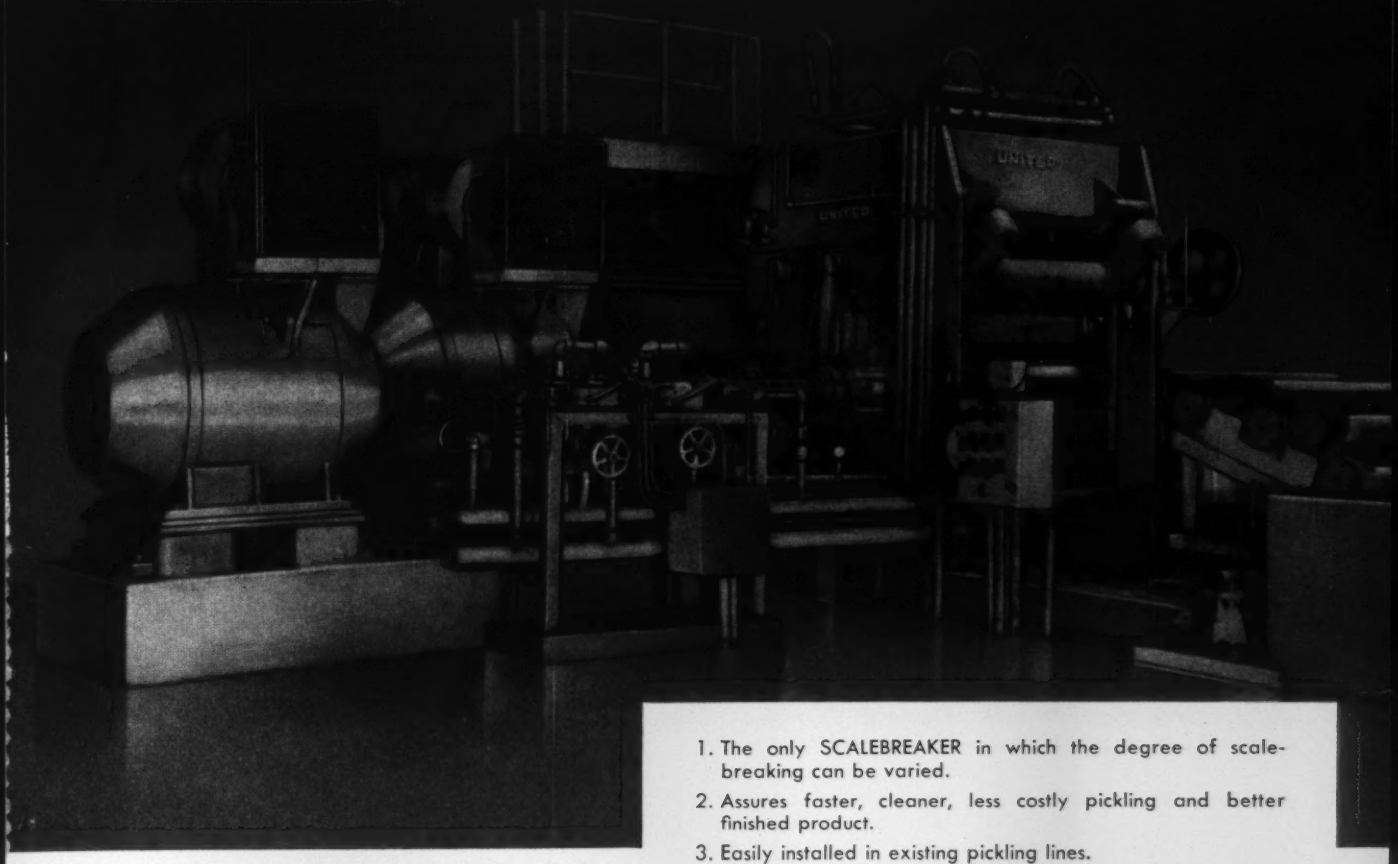
Designed for the sheet metal, wrought iron and wire fabricating industries, a combination spot and projection welder features high speed and flexibility for die mounting. It has a combined platen and standard arm arrangement, precision roller bearing ram, and extreme ruggedness. A hydraulic jack provides easy up and down adjustment of the lower extension arm. The arm withstands great pressures without deflecting. A self-adjusting pressure switch maintains pressure firing. (Alphil Spot Welder Mfg. Corp.)

For more data circle No. 49 on postcard, p. 103

UNITED®

NEW *Strip Processing* SCALEBREAKER





1. The only SCALEBREAKER in which the degree of scale-breaking can be varied.
2. Assures faster, cleaner, less costly pickling and better finished product.
3. Easily installed in existing pickling lines.

Write today for complete engineering data.

UNITED

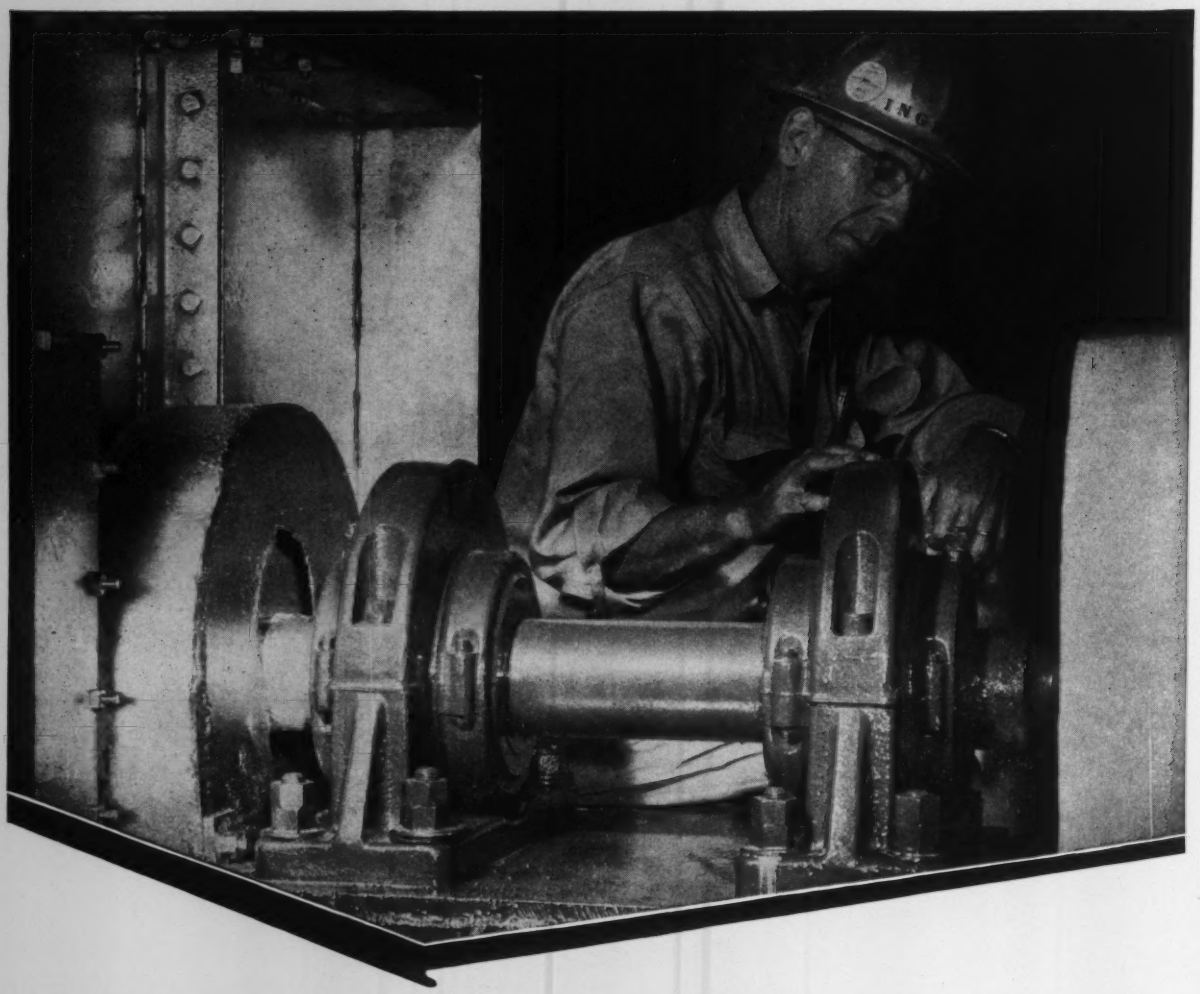
ENGINEERING AND FOUNDRY COMPANY

PITTSBURGH, PENNSYLVANIA

Plants at: Pittsburgh • Vandergrift • Youngstown • Canton • Wilmington

Subsidiaries: Adamson United Company, Akron, Ohio
Stedman Foundry and Machine Company, Inc., Aurora, Indiana

Designers and Builders of Ferrous and Nonferrous Rolling Mills, Mill Rolls, Auxiliary Mill and Processing Equipment, Presses and other heavy machinery. Manufacturers of Iron, Nodular Iron and Steel Castings and Weldments.



Former bearings took a day . . . this bearing replaced in 1 hour and a half!

Here is one of several 4-7/16" shaft size split roller bearing pillow blocks installed on large, high speed fans at the Kaiser Aluminum & Chemical plant in Baton Rouge, Louisiana. Split roller bearings were purchased by Kaiser after thorough study and on the recommendation of our sales engineers! Our recommendation was based on the ability of these bearings to stand up under constant use and because it is split right-down-to-the-shaft, removal is both simple and fast.

Shown above is Maintenance General Foreman, Ivy Ingram, with the bearing his crew replaced in only one hour and a half. It formerly took many more hours to pull the sheave or coupling, pull the bearing, dress the shaft and install a new bearing. With this new split bearing, they simply removed six cap bolts and went to work.

We are authorized distributors for all the bearings we sell. They come to you in the manufacturers' boxes guaranteed by the maker and our company. Ask for our recommendation on all bearing requirements–There's a branch near you giving fast service 24 hours a day!

Providing bearing service in the North ➤ **BEARINGS, INC.**

OHIO: Akron • Canton • Cincinnati • Cleveland • Columbus • Dayton • Elyria • Hamilton • Lima • Lockland • Mansfield • Painesville • Toledo • Youngstown Zanesville • **INDIANA:** Ft. Wayne • Indianapolis • Muncie • Terre Haute • **PENNSYLVANIA:** Erie • Johnstown • Philadelphia • Pittsburgh • York **WEST VIRGINIA:** Charleston • Huntington • Parkersburg • Wheeling • **NEW JERSEY:** Camden **NEW YORK:** Belanrol Corp., Buffalo • Niagara Falls • **MARYLAND:** Baltimore • **DELAWARE:** Wilmington

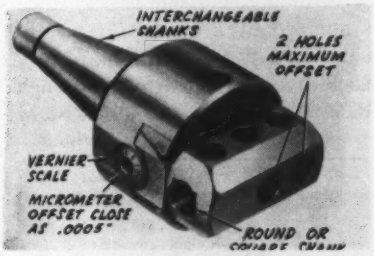
and

in the South ➤ **DIXIE BEARINGS, INC.**

FLORIDA: Jacksonville • **GEORGIA:** Atlanta • **KENTUCKY:** Louisville • **LOUISIANA:** Baton Rouge • New Orleans **N. CAROLINA:** Charlotte • Greensboro • **S. CAROLINA:** Greenville • **TENNESSEE:** Chattanooga • Kingsport • Knoxville • Nashville **VIRGINIA:** Norfolk • Richmond

Offset Boring Heads

A long, stocky tool block provides horizontal tool support in a new series of contour boring heads. A vernier on the body facilitates adjustment of a micrometer offset

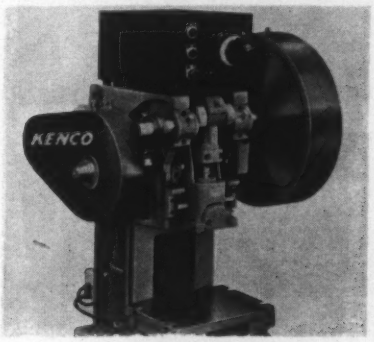


screw. This makes possible close visual offset adjustments. The boring heads are available in three sizes with nominal ½, ¾ or 1-in. bar capacities. (Flynn Mfg. Co.)

For more data circle No. 50 on postcard, p. 103

Press Cuts Hazards

Built-in electrical controls permit effective use of overload detectors, or other checking devices, to monitor proper feeding or sense malfunctions during operation. Elimi-



nation of both clutch and flywheel allows instantaneous stopping or starting of the press at any point in its stroke. The presses are available in 5, 8, 12, 15 and 18 ton capacities. (Kenco Mfg. Co.)

For more data circle No. 51 on postcard, p. 103

Forklift Mast

A triple-lift mast for forklift trucks enables operation in 6-ft-wide aisles and the tiering of loads up to 15 ft high, but will pass through 7-ft-high doors. Its capacity is 3000 lb. It is standard on a series of forklift trucks. (Lewis-Shepard Products, Inc.)

For more data circle No. 52 on postcard, p. 103

Bench Lathe

Useful for making small parts or models in the research lab or mockup shop, a bench lathe fits in a 16-in.-wide space. It is simple to operate, and can be set up as a lathe, drill press, milling machine, tool grinder, polisher, and even a hand drill. It can do machine work with tolerances up to 0.004 in. It comes with standard lathe accessories. Optional attachments and accessories include jigsaw, table

It's LASSMAN for Dependable Industrial Hydraulic Equipment

A coil downender presents some difficult hydraulic control problems. These stem largely from the fact that there is a point in the cycle where the load shifts from a resisting to an overriding one. In addition, high speed of operation with smooth acceleration and deceleration is essential.

The LASSMAN HYDRAULIC SYSTEM for a Coil Downender is simplicity in itself. We eliminate the customary valves for speed control, acceleration, deceleration, pressure relief and counterbalance. Oil cooling is unnecessary in most installations. Performance is further enhanced by virtue of our trunnion type cylinder which permits rigid installation of piping, thereby eliminating hoses.

Such a well designed Hydraulic System is typical of BENJAMIN LASSMAN & SON. It is your guarantee of top performance with minimum maintenance.

Quality EQUIPMENT for *Quality* PERFORMANCE

BENJAMIN LASSMAN & SON Route 8, GLENSHAW, PA

SIMONDS

INDUSTRIAL CUT GEARS

LARGE OR SMALL HEAT TREATED OR PLAIN

SIMONDS has over 60 years' experience in cutting quality industrial gears. We can supply any type of gear in cast or forged steel, gray iron, bronze, Meehanite, rawhide or bakelite in a full range of sizes adaptable to the material. Also heat-treated, case or flame hardened gears of carbon or alloy steel. Send us your requirements for quotation.

Custom
GEAR CUTTING

SIMONDS' facilities can produce any type of custom gear from your blanks if you prefer. Same quality . . . same prompt service.

QUALITY GEARS FOR OVER 65 YEARS

SPUR GEARS
BEVEL GEARS
MITRE GEARS
WORMS WORM GEARS
RACKS PINIONS

Also stock carrying distributors of Ramsey Silent Chain Drives and Couplings; and industrial V-belts.

SIMONDS GEARS

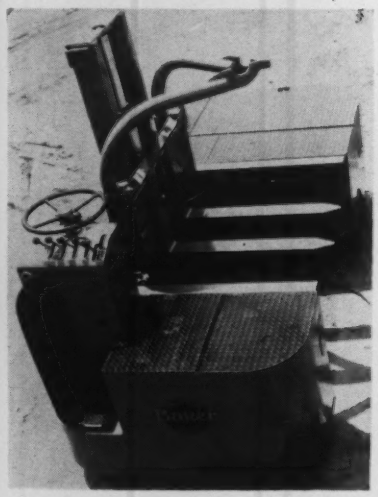
THE SIMONDS GEAR & MFG. CO.
LIBERTY at 25TH PITTSBURGH 22, PA

NEW EQUIPMENT

saw, threading attachment, indexing and dividing attachment, and others. (American Edelstaal, Unimat Div.)
For more data circle No. 53 on postcard, p. 103

Dual Crane Lift Truck

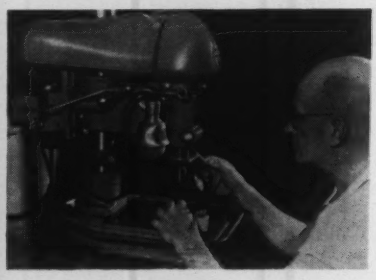
Electric powered sideloading is a feature of a versatile lift truck. It's equipped with twin crane booms with 4000 or 6500 lb capacities. Booms and forks have the



same capacities, and are arranged so that a load suspended from them is automatically transported at the proper center. (Baker Industrial Trucks, Div. of Otis Elevator Co.)
For more data circle No. 54 on postcard, p. 103

Precision Drill Press

A 14-in. high speed drill press, with speeds up to 12,000 rpm, makes practicable small hole drilling where precision and sensitivity are needed. The press is recom-



mended for all drillable materials. Drill breakage and work spoilage is reduced and accurate operation insured. The drill press is available in single spindle models, or with any number of spindles in multiple spindle set-ups. (Walker - Turner, Div. of Rockwell Mfg. Co.)
For more data circle No. 55 on postcard, p. 103

Sharp-Flame Torch

Advantageous flame performance is attained by a hand torch whose wide range flame operation, from a single tip, can be swiveled through 360°. Tip changes are unnecessary

WARD STEEL CO.

PROMPT WAREHOUSE SERVICE ONLY
Most Complete Stock in America of
BLUE TEMPERED SPRING STEEL
We believe that the way to sell is to carry a stock which permits satisfying any reasonable warehouse demand.

87B Rindge Ave. Ext. Phone UN 4-2480
CAMBRIDGE 40, MASS.
Branch
3042-3058 W. 51st Street, CHICAGO, ILL.
Phone: Grovehill 6-2600

GALVANIZED SHEETS (FLAT)
ASTM A93, Lockforming Quality
Zinc Coating, 1.25 oz. per sq. ft.
IN STOCK IMMEDIATE SHIPMENT

NEW YORK

28 Tons	22 GSG	48 x 96
45 Tons	24 GSG	48 x 96
76 Tons	24 GSG	48 x 120
93 Tons	26 GSG	36 x 120
3 Tons	28 GSG	36 x 96
117 Tons	28 GSG	36 x 120

NEW ORLEANS

10 Tons	24 GSG	36 x 96
11 Tons	28 GSG	36 x 96
2 Tons	30 GSG	36 x 96

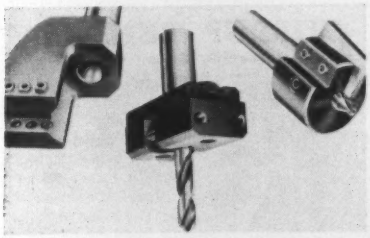
FABRIKANT STEEL PRODUCTS, INC.
620 Fifth Avenue, New York 20, N. Y.
PHONE: Circle 7-8435

due to the extensive flame range. The burner operates on low-pressure city gas, natural, mixed, propane, or hydrogen, with oxygen at gas pressures of ½ psi and oxygen pressure at 1 to 2 psi. (Bethlehem Apparatus Co., Inc.)

For more data circle No. 56 on postcard, p. 103

Turret Lathe Tools

Providing production economy and higher profits, these turret lathe tools insure rigidity and close tolerance accuracy through long pro-

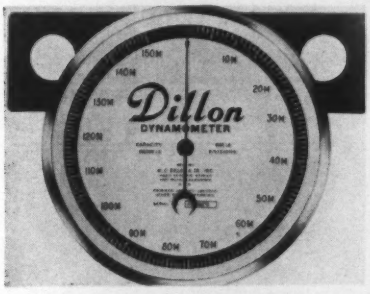


duction runs. The tools are machined from high grade, hardened and ground steel. Each tool design is available in three sizes. (Dimension Products)

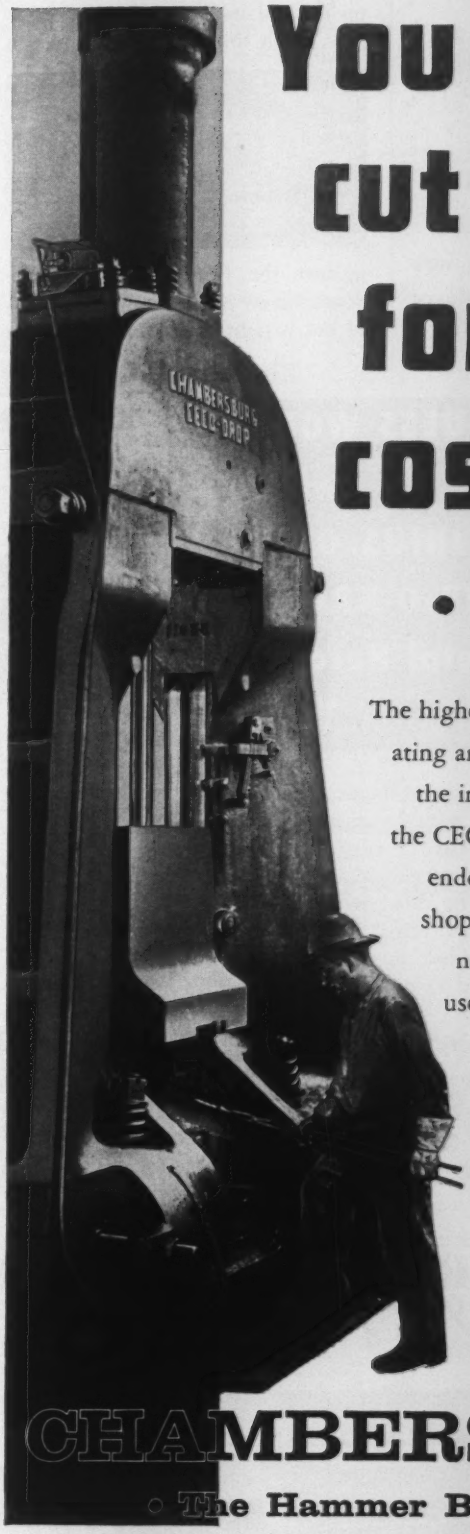
For more data circle No. 57 on postcard, p. 103

Force Measurement

Two new capacities, 150,000 and 200,000 lb, have been added to a line of direct-reading, traction-type dynamometers. Fifteen capacities, from 0-500 lb up to 0-200,000 lb, are now available. Both new units have a net weight of 23 lb, and are



made to withstand rough usage. Some of the instrument's incorporated features are: a resetable red maximum hand remembering point of peak load, removable clevises of drop forged alloy steel, and individual calibration to an accuracy of ±2 pct of full range. The dyna-



You can cut your forging costs in • 1960

The higher production, lower operating and maintenance costs, and the improved safety features of the CECO-DROP account for its endorsement by leading forge shops all over the world. Why not join the more than 130 users who are being "thrifty in '60" and install Ceco-Drops in *your* shop.

Send for the 28-page bulletin, "The Ceco-Drop and its place in Forge Shop Modernization." Write today.

•

CHAMBERSBURG ENGINEERING CO.
Chambersburg, Penna.

CHAMBERSBURG

• The Hammer Builders •

DESIGNERS AND MANUFACTURERS OF THE IMPACTER

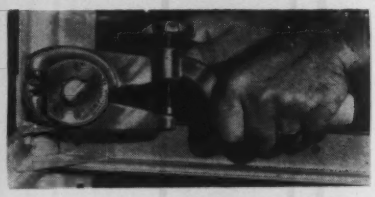
When it's a vital part, design it to be FORGED

mometer measures torque, traction, tension, compression or weight. (W. C. Dillon & Co., Inc.)

For more data circle No. 58 on postcard, p. 103

Nut Splitter

Stubborn, rusted nuts can now be reached, split, and removed quickly and easily with a new swivel jaw nut splitter designed to cut nuts up to, and including, ⅞-in. across flats. With the swivel blade placed



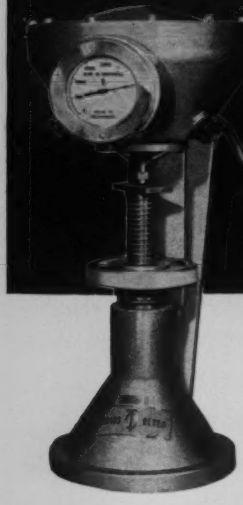
against the side of the nut, the power screw is turned manually until jaw is tight against nut, and then tightened until nut is split. (H. K. Porter, Inc.)

For more data circle No. 59 on postcard, p. 103

Alloy-Steel Saw Band

Made of a special alloy steel with a high proportion of vanadium carbide, a new bandsaw blade has exceptional cutting power and ability to withstand abrasion. It also has high fatigue resistance and flexibility comparable with that of carbon-

There's No "GUESS WORK" with a TINIUS OLSEN AIR-O-BRINELL Metal Hardness Tester



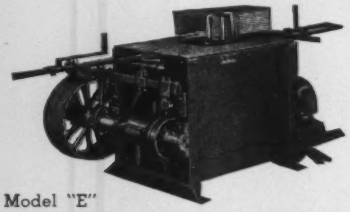
Preset the exact load you want by means of accurately regulated and maintained air pressure—no dead weights or hydraulics. Reproducible load application is assured. Use anywhere standard air pressure is available—in lab or shop.

Get the facts. Write for Bulletin 52.

TINIUS OLSEN
Testing Machine Co.
2120 Easton Rd. • Willow Grove, Pa.

KARDONG STIRRUP BENDER
For Concrete Reinforcing Bars

This bender is the result of our 30 years' experience in the manufacture of reinforcing bar benders. One man can easily bend 300 four bend stirrups an hour. This bender is also a very practical bender for light slab bars and miscellaneous bending. Write for catalog of our complete line of reinforcing bar benders.



Model "E"

KARDONG BROTHERS, INC.
MINNEAPOLIS 13, MINN.

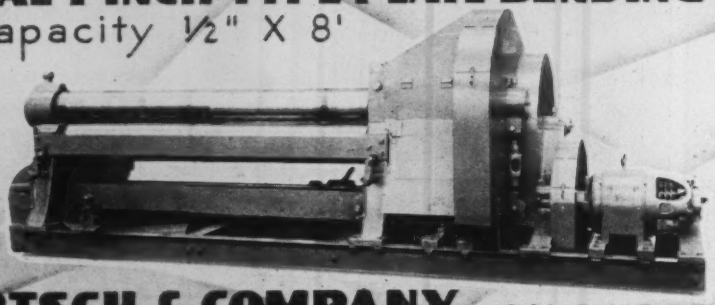
SELLING TO THE EUROPEAN MARKET?

Excellent sales opportunities exist in the European Common Market for industrial equipment and technical products. A New York international business firm with office in Geneva, and established marketing outlets throughout Europe, is interested in adding several selected manufacturing accounts. We function as your European sales office, and represent you on the highest commercial and technical levels. Only reputable firms with good references considered.

Box H-21, Suite 1606, Times Tower Bldg., New York 36, N. Y.

GOSS and DE LEEUW
MULTIPLE SPINDLE
CHUCKING MACHINES
Tool Rotating
GOSS & DE LEEUW MACHINE CO., KENSINGTON, CONN.

INITIAL PINCH TYPE PLATE BENDING ROLL
Capacity ½" X 8'



Our Line
Light and heavy machinery for all classes of sheet metal, plate and structural work

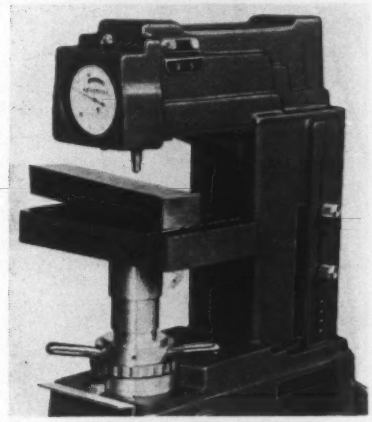
BERTSCH & COMPANY, CAMBRIDGE CITY • INDIANA

steel bands. On standard machines it outlasts carbon-steel bands three-to-one and cuts the difficult materials. On high-production machines it matches the performance of HSS bands—at a 25 pct cost saving. (Millers Falls Co.)

For more data circle No. 60 on postcard, p. 103

Hardness Tester

Automatically removing major testing loads, and eliminating much of the effect of operator technique, a new motorized hardness tester gives greater reproducibility of test results. The hardness tester is avail-

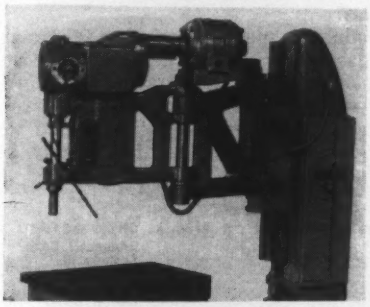


able as a combination tester providing regular and superficial Rockwell Hardness testing, or as a single purpose tester for either regular or superficial testing. (Torsion Balance Co.)

For more data circle No. 61 on postcard, p. 103

Radial Drill Press

Incorporating a new electrical system, a radial drilling and tapping machine employs a jointed arm permitting ready placement of the head



in relation to the work. The saddle, carrying hinged arms, is mounted on the column with an adjustable gib. Vertical travel is provided by a screw and optional motor drive. The spindle can be moved in a radius from 15- to 50-in. away from the saddle trunnions. For a 60-cycle installation, spindle speeds are from 95 to 1140 rpm; the machine's capacities are 1⅛-in. drill, 1-in. tap in cast iron, 1-in. drill, ⅞-in. tap in steel. (Foote-Burt Co.)

For more data circle No. 62 on postcard, p. 103

Spindle Turret Drill

Transmission and turret spindle design improvements provide a stronger, smoother, trouble-free drive that augments machine accuracy and finish. Standard clutch elements automatically shift to supply pre-set speeds to six spindles in the turret, ranging from 325 to 4050 rpm. An optional feature is pre-selective skip-indexing which reduces operator fatigue, and increases net speed rate of the turret cycle. (Burgmaster Corp.)

For more data circle No. 63 on postcard, p. 103

Do You Need
WIDE SHEARED STEEL PLATE ASTM A-7?

IN STOCK FOR IMMEDIATE SHIPMENT FOB NEW YORK

110 Tons 1/2" x 84" x 240"
100 Tons 1/4" x 84" x 240"
100 Tons 1/4" x 84" x 360"
81 Tons 3/8" x 84" x 360"
54 Tons 1/2" x 84" x 360"
81 Tons 3/4" x 96" x 360"
110 Tons 1" x 96" x 360"

Also in stock above thicknesses in widths 5' and 6'

ABS GRADE A-SHEARED STEEL PLATES

American Bureau of Shipping Specs

PROMPT SHIPMENT FOB NEW YORK

200 NT—1/2" x 72" x 240"
50 NT—1/2" x 84" x 240"
100 NT—1/4" x 72" x 240"
150 NT—1/4" x 84" x 240"
100 NT—1/4" x 96" x 240"
100 NT—1/2" x 72" x 240"
100 NT—3/8" x 72" x 240"
50 NT—3/8" x 84" x 240"
75 NT—1/2" x 72" x 240"
75 NT—1/2" x 84" x 240"

Subject prior sale

FABRIKANT
STEEL PRODUCTS, INC.
620 Fifth Avenue, New York 20, N. Y.
Phone: Circle 7-8435

Since 1903

GEO. F. MARCHANT CO.

PUNCHES - DIES
RIVET SETS

Write Dept. B for Catalog 60

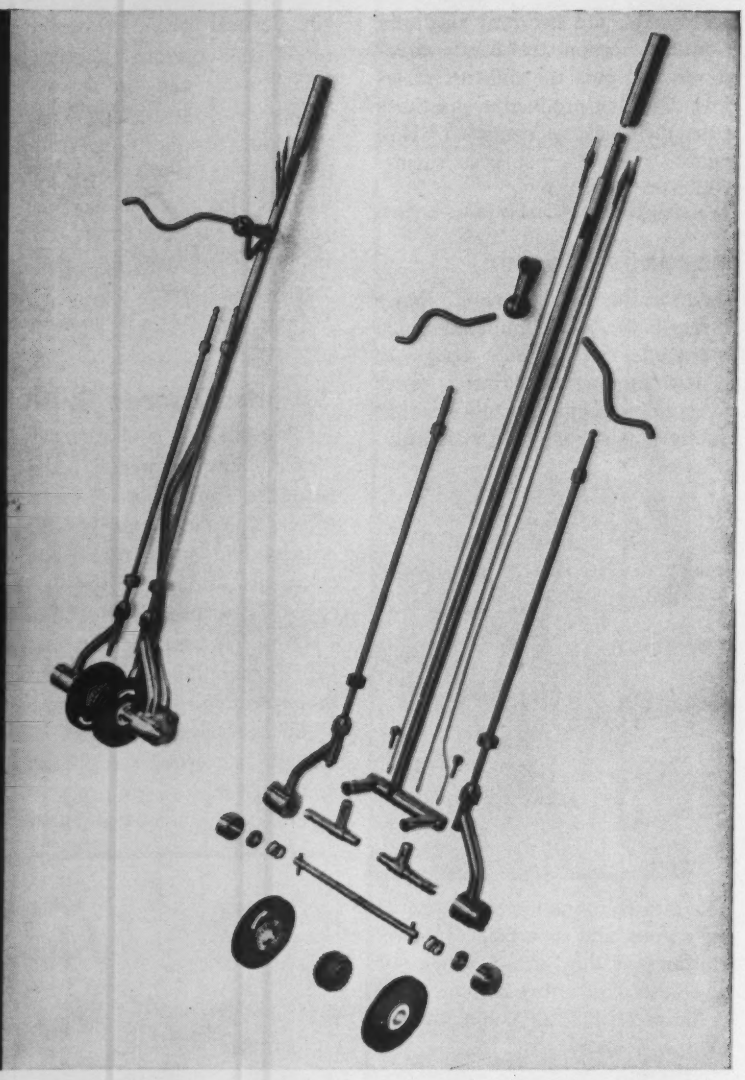
and

New Stock List

1420 South Rockwell Street, Chicago 8, Illinois

HERE'S HOW STILL ANOTHER MANUFACTURER JOINS STAINLESS STEEL TUBING:

He uses Handy & Harman's BRAZE 630



He's one of many manufacturers and fabricators who have found—to their lasting satisfaction—that Handy & Harman silver alloy brazing is the final answer to stainless steel joining problems.

Super-Donic Manufacturing Company, Atlanta, Georgia, manufactures "Dual Arm Transmissions" for the dental industry. Most everybody has—at one time or another—seen and/or felt this unit in operation.

It is fabricated of small diameter 304 and 316 stainless steel tubing and, in its assembled form, consists of some 17 separate brazed joints. Joints must be strong, corrosion resistant and neat-appearing.

Each of the 17 joints is hand-torch brazed with Handy & Harman BRAZE 630 wire and HANDY FLUX TYPE B-1. There's no question that this is a unique application. There's no question, either, that the application is stainless steel. The ease and economy with which this manufacturer solves his problems can be just as readily applied to *your* stainless steel joining problems.

Strength, production speed, electrical and thermal conductivity, gas and liquid tightness and low cost are *natural* benefits of silver alloy brazing. We think it worth your while to learn more about this remarkable metal-joining method—we'll be glad to send you any information you ask for. Handy & Harman, 82 Fulton St., New York 38, N. Y.

FOR A GOOD START: BULLETIN 20

This informative booklet gives a good picture of silver brazing and its benefits... includes details on alloys, heating methods, joint design and production techniques. Write for your copy.

Your No. 1 Source of Supply and Authority on Brazing Alloys

HANDY & HARMAN

General Offices: 82 Fulton St., New York 38, N. Y.

DISTRIBUTORS IN PRINCIPAL CITIES

Offices and Plants
Bridgeport, Conn.
Chicago, Ill.
Cleveland, Ohio
Dallas, Texas
Detroit, Mich.
Los Angeles, Calif.
New York, N. Y.
Providence, R. I.
San Francisco, Calif.
Montreal, Canada
Toronto, Canada

The Iron Age Summary

Inventories: Key to 3rd Quarter

Whether steel users build up big inventories will determine how long the steel market stays tight.

Incentives to keep costs down are countered by threat of higher prices later on.

▪ Just how long the steel market retains its tension depends on how users set their inventory policies.

The answer to the general question, whether to continue inventory buildup after shipments and inventories come into balance, can make the difference between a big or average third quarter.

No Easing Now — There is no immediate easing in the market now. But that will change in the second quarter as some products begin to meet demand. For others, particularly flat-rolled, the market will stay tight through June.

Faced with balanced shipments, users will be affected by conflicting influences on inventory policies.

The Incentives — Incentive to keep inventories relatively low comes from desire to keep costs down. This influence of economy is further bolstered by the prospect of tight money and the high cost of financing, as well as carrying, large stocks of steel.

Principal factor in a possible major buildup is price uncertainty. Although steel companies are close-mouthed on possible price increases, the threat of higher steel costs is strong.

Although many steel users and producers play down the influence of price on buying, there has always been price buying in the steel industry as long as increases are probable.

Price Factors—There are evidences of higher steel costs to users, even without any list price advances. These include:

Refusal to absorb freight costs and a definite cutback of out-of-district shipments.

Product substitutions. In the tight market that prevails, users will accept a higher-cost product when a lower-cost item, which is satisfactory for use, is not available.

Continued movement of premium-priced steel. Brokers and small warehouses are still able to move high-cost steel, although the urgency is gone from this segment of the market. But major users will take high-priced steel to fill spot needs, which continue to occur.

Small Mills Hurt—Among the major mills, price talk is at a minimum, even to the point of saying that price increases are unlikely until November, if then. But this out-of-sight-out-of-mind attitude is not present in the small mills.

These mills, which have a higher cost of operation, know they have to make their profit while the market remains tight. The feeling is that if they raise prices late this year, they will have missed their market peak.

For these reasons, the prospect of price movement is still strong. And the market will retain uncertainty until there is some movement.

Steel Output, Operating Rates

Production (Net tons, 000 omitted)	This Week 2,736	Last Week 2,736	Month Ago 2,661	Year Ago 2,066
Ingot Index (1947-1949=100)	170.2	170.2	165.7	128.7
Operating Rates				
Chicago	95.0	96.0*	96.5	86.0
Pittsburgh	97.5	96.5*	96.0	68.5
Philadelphia	102.0	102.0	100.0	75.0
Valley	90.0	89.0*	90.0	55.0
West	90.0	90.0	92.0	85.0
Cleveland	98.0	96.0*	93.0	79.0
Buffalo	105.0	105.0	107.0	71.0
Detroit	103.0	105.0*	96.0	96.0
South	93.5	93.5	89.5	71.0
South Ohio River	97.0	100.0*	91.0	81.0
Upper Ohio River	92.0	91.0*	94.0	73.0
St. Louis	99.0	92.5*	78.0	84.0
Aggregate	96.0	96.0	94.0	73.0

*Revised

Prices At a Glance

(Cents per lb unless otherwise noted)

	This Week	Week Ago	Month Ago	Year Ago
Composite price				
Finished Steel, base	6.196	6.196	6.196	6.196
Pig Iron (Gross ton)	$66.41	$66.41	$66.41	$66.41
Scrap No. 1 hvy (Gross ton)	$41.83	$41.50	$47.17	$41.17
No. 2 bundles	$28.17	$28.17	$27.83	$29.17
Nonferrous				
Aluminum ingot	28.10	28.10	26.80	26.80
Copper, electrolytic	33.00	33.00	33.00	29.00
Lead, St. Louis	11.80	11.80	12.30	12.80
Magnesium	36.00	36.00	36.00	36.00
Nickel, electrolytic	74.00	74.00	74.00	74.00
Tin, Straits, N. Y.	100.00	99.50	99.00	99.625
Zinc, E. St. Louis	13.00	13.00	12.50	11.50

More Work for Tool, Diemakers

Tool and diemakers are encouraged about business in 1960. They see a good year.

One of the big aids in making this a profitable year is the auto industry.

▪ A feeling of encouragement is spreading through the tool and die industry as 1960 gets under way. No boom is forecast. But continued improvement is a prospect.

Customers will spend more money for better tools. Shipments of tools and dies will increase. Greater profits will result.

Better Year—The National Tool & Die Mfg. Assn. estimates 1959 shipments by tool and die producers topped recession year 1958 by 15 pct. At least another 15 pct rise is indicated this year. This would bring business approximately back to the 1957 level.

Estimates are the total value of shipments of stamping tools, forging dies, jigs, fixtures, industrial molds, special machines and special gages approached $1 billion last year.

Advance Notice—Even the possibility of rising costs is not dampening hopes for the coming 12 months. One large tool company recently sent out advance notice to customers that higher prices will go into effect late in January.

Outlook is almost uniformly bright around the country. Particular improvement is in store for those engaged in automotive, electronics, office equipment and household appliance programs.

Tooling activity for farm equipment may be down a bit. But the heaviest blow will be to companies involved in supplying machines for the aircraft industry, including engines and equipment.

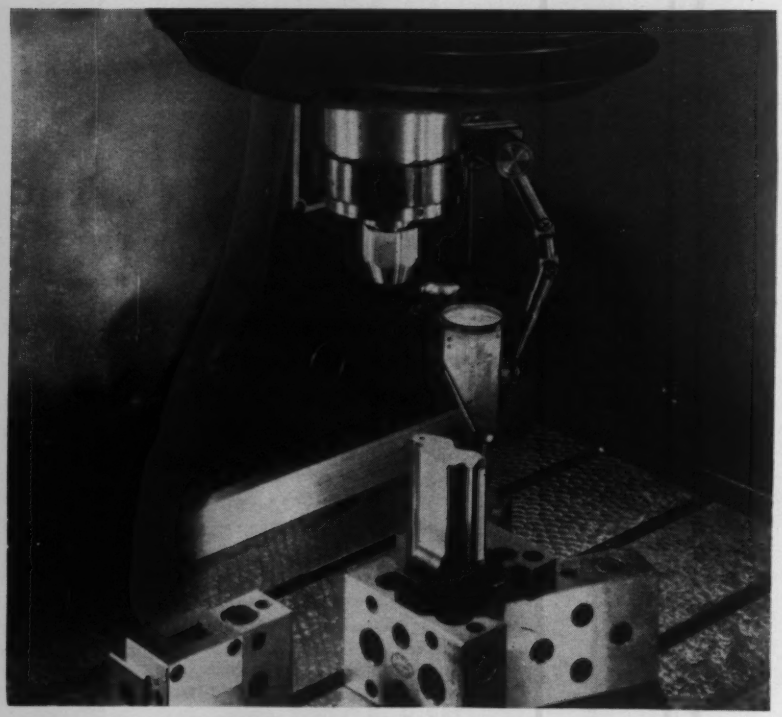
Cutback Hurts — The biggest shock came recently with a severe cutback in government orders for B-70 bombers. Work on only two of the heavy planes will start this year instead of the several hundred which had been banked on.

Instead the government will spend its money on missile programs. But the amount of missile work will not offset the loss in aircraft contracts. The Los Angeles-San Diego area will be particularly affected.

Auto Activity High—Detroit tool and die trade is building up steam right now. Shops, immersed in making machinery for 1961 model car manufacture, expect to reach a peak of activity in March. The tool and die labor force in the Motor City will reach its height then.

There will be a gradual leveling off in Detroit from April through June, when 1961 model tooling work ends. During July, August and September, Detroit tool and die shops will be scouting for work outside the auto industry to keep them busy. Business will pick up again in September, when 1962 model tooling programs start.

GM Helps—What is making this year a good one for some Detroit tool and die shops are healthy General Motors contracts. GM is making an across-the-board styling change on 1961 models.



TOOLS AND DIES: Outlook is good around the country.

Another example of National Roll quality control

Elmer Grinder, left, of National's steel foundry discusses chill location with Bill Williamson of the Sales Department.

Roll molds determine life, not just dimensions

Molding techniques for steel rolls are, of course, directed at obtaining a casting with accurate dimensions for economical machining into precise shaped or plain rolls.

But just as important as dimensions —determined by the "sweep" pattern shown above—is the metallurgical function built into every roll mold. Metal "chills" are carefully located to control cooling of the steel in a manner that will produce a roll both metallurgically and physically sound.

Started on paper, the chill layout is translated into a mold of metal and sand under the watchful attention of National's experienced steel foundry personnel. These men know foundry practice. But perhaps more importantly, they know the demands that are made on roll soundness in the customer's mill.

This is a part of National's service which means better rolls for you. It's one of the many reasons why . . .

National's the growing name in rolls

NATIONAL ROLL & FOUNDRY DIVISION

GENERAL STEEL CASTINGS CORPORATION, Avonmore (Westmoreland County), Pa.

General Steel Castings Corporation, General Offices: Granite City, Illinois • Plants: Granite City, Ill., Eddystone, Pa., Avonmore, Pa.

Buyers Keep Pressure On for Deliveries

Steel users would like to see mills speed up deliveries and increase their allotments.

But it isn't likely to happen. It would require significant cancellations by others. And mills are booked with firm orders.

■ Customers are still riding herd on the steel mills in hopes they can get faster deliveries or increased allotments. But there is little they can do to get favored treatment.

While there is still some backsliding on deliveries, particularly sheets, they are generally more predictable than they were several weeks ago.

Transportation difficulties continue to exist, however. In the Midwest, a shortage of trucks is causing more headaches than any shortage of freight cars. Comparatively mild weather is credited with keeping the situation from being worse than it is.

Only scattered cancellations have been reported. For the most part, these involve insignificant tonnages. And other customers are eager to take the extra steel.

Sheet and Strip—Mills are still under intense pressure from customers to speed up delivery and increase allotments of sheet steel. But they're receiving little encouragement from the mills. Instead, mill delivery times are often extended and allotments are being reduced.

A major **Pittsburgh** sheet mill says it hasn't received any deferments or cancellations—and doesn't expect any. An **Eastern** mill says its sheet capacity for the entire first half is committed, although it hasn't officially entered all actual orders on its books yet.

In the **Midwest,** most automakers have boosted orders in district sales offices in the hope they'll get more than their quotas. Mill surpluses are quickly sold. Some carryovers in the **Chicago** market are already out to four weeks. This will have the effect of reducing actual tonnage delivered to some customers by a third in the first quarter.

However, there are signs that strip steel may be out of the critical category before the end of the second quarter. Some strip orders have been set back from scheduled February delivery to April at the customers' request.

Plate—A producer on the **East Coast** notes that fabricators are currently building inventories of light plate because current jobs don't demand all of the steel being delivered.

Foreign plate is being offered in **Chicago.** One-quarter in. plate is offered at 10¢ per CWT under the domestic price. However, a premium of 40¢ to 60¢ is being asked for wide plate.

Bars—In the **Midwest,** smaller automotive forging sizes are hot items because of high automobile production. Lack of hot rolled bars is causing a stretchout in delivery times for cold-finished bars.

Foreign producers have begun to take advantage of the tight market by offering cold-finished bars in **Chicago.** Most of it is coming from Canada and is being bought by users who find themselves strapped for material. So far, no long term supply contracts have been reported.

Pipe and Tubing—Pipe mills in **Pittsburgh** expected to be filled for March on buttweld in about a week. Mills are running a full 20 turns and expect to maintain this rate through most of the first quarter.

There have been some deferments of January tonnage, but no major cancellations. Even so, jobber stocks were decimated last fall and inventory rebuilding will keep business fairly strong through the first half.

Wire—Wire products are moving well. While customers in many areas have voluntarily stretched out orders since settlement of the steel strike, there is still pressure for delivery of some tonnage. Merchant products are reported to be moving well in **Cleveland** as dealers place orders early to build up inventories.

Imports are still taking a share of the market. Foreign producers of high carbon wire are making a strong bid for the furniture market in **Chicago.** And one automotive supplier there is using foreign wire almost exclusively.

Stainless — Business is divided along two lines: Automotive and non-automotive. Stainless strip for auto trim is moving well with some pressure for spot deliveries, but not for increased tonnage. Cutlery and appliance manufacturers are also taking in good supplies.

But non-automotive stainless users aren't standing in line for material. They are placing good orders, but inventories are nearly normal because a large segment of the stainless producers continued to operate during the steel strike.

PURCHASING AGENT'S CHECKLIST

New way to make containers spurs plastics market. P. 46

Government sales of nickel assure ample supplies. P. 47

Scrap industry pushes research to upgrade its product. P. 48

COMPARISON OF PRICES

(Effective Jan. 19, 1960)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price changes from previous week are shown by an asterisk (*).

	Jan. 19 1960	Jan. 12 1959	Dec. 22 1959	Jan. 20 1959
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	5.10¢	5.10¢	5.10¢	5.10¢
Cold-rolled sheets	6.275	6.275	6.275	6.275
Galvanized sheets (10 ga.)	6.875	6.875	6.875	6.875
Hot-rolled strip	5.10	5.10	5.10	5.10
Cold-rolled strip	7.425	7.425	7.425	7.425
Plate	5.30	5.30	5.30	5.30
Plates, wrought iron	13.55	13.55	13.55	13.55
Stainl's C-R strip (No. 302)	52.00	52.00	52.00	52.00
Tin and Terneplate: (per base box)				
Tinplate (1.50 lb.) cokes	$10.65	$10.65	$10.65	$10.65
Tin plates, electro (0.50 lb.)	9.35	9.35	9.35	9.35
Special coated mfg. ternes	9.90	9.90	9.90	9.90
Bars and Shapes: (per pound)				
Merchants bar	5.675¢	5.675¢	5.675¢	5.675¢
Cold finished bar	7.65	7.65	7.65	7.65
Alloy bar	6.725	6.725	6.725	6.725
Structural shapes	5.50	5.50	5.50	5.50
Stainless bars (No. 302)	46.75	46.75	46.75	45.00
Wrought iron bars	14.90	14.90	14.90	14.90
Wire: (per pound)				
Bright wire	8.00¢	8.00¢	8.00¢	8.00¢
Rails: (per 100 lb.)				
Heavy rails	$5.75	$5.75	$5.75	$5.75
Light rails	6.725	6.725	6.725	6.725
Semifinished Steel: (per net ton)				
Rerolling billets	$80.00	$80.00	$80.00	$80.00
Slabs, rerolling	80.00	80.00	80.00	80.00
Forging billets	99.50	99.50	99.50	99.50
Alloys, blooms, billets, slabs	119.00	119.00	119.00	119.00
Wire Rods and Skelp: (per pound)				
Wire rods	6.40¢	6.40¢	6.40¢	6.40¢
Skelp	5.05	5.05	5.05	5.05
Finished Steel Composite: (per pound)				
Base price	6.196¢	6.196¢	6.196¢	6.196¢

	Jan. 19 1960	Jan. 12 1960	Dec. 22 1959	Jan. 20 1959
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	$70.57	$70.57	$70.57	$70.57
Foundry, Southern Cin'ti	73.87	73.87	73.87	73.87
Foundry, Birmingham	62.50	62.50	62.50	62.50
Foundry, Chicago	66.50	66.50	66.50	66.50
Basic, del'd Philadelphia	70.07	70.07	70.07	70.07
Basic, Valley furnace	66.00	66.00	66.00	66.00
Malleable, Chicago	66.50	66.50	66.50	66.50
Malleable, Valley	66.50	66.50	66.50	66.50
Ferromanganese, 74-76 pct Mn, cents per lb‡	12.25	12.25	12.25	12.25
Pig Iron Composite: (per gross ton)				
Pig iron	$66.41	$66.41	$66.41	$66.41
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$43.50	$43.50	$42.50	$45.50
No. 1 steel, Phila. area	41.50	41.50	41.50	35.50
No. 1 steel, Chicago	40.50*	39.50	39.50	42.50
No. 1 bundles, Detroit	39.50	39.50	38.50	36.50
Low phos., Youngstown	48.50	48.50	48.50	46.00
No. 1 mach'y cast, Pittsburgh	55.50	55.50	55.50	51.50
No. 1 mach'y cast, Phila.	54.50	54.50	54.50	48.50
No. 1 mach'y cast, Chicago	60.50	60.50	60.50	54.50
Steel Scrap Composite: (per gross ton)				
No. 1 hvy. melting scrap	$41.83*	$41.50	$47.17	$41.17
No. 2 bundles	28.17	28.17	27.83	29.17
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$14.75-15.50	$14.75-15.50	$14.75-15.50	$14.50
Foundry coke, prompt	18.50	18.50	18.50	18-18.50
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	33.00	33.00	33.00	29.00
Copper, Lake, Conn.	33.00	33.00	33.00	29.00
Tin, Straits, N. Y.	100.00†	99.50	99.00	99.625
Zinc, East St. Louis	13.00	13.00	12.50	11.50
Lead, St. Louis	11.80	11.80	12.30	12.80
Aluminum, virgin ingot	28.10	28.10	26.80	26.80
Nickel, electrolytic	74.00	74.00	74.00	74.00
Magnesium, ingot	36.00	36.00	36.00	36.00
Antimony, Laredo, Tex.	29.50	29.50	29.50	29.50

† Tentative. ‡ Average. ** Revised.

Finished Steel Composite
Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite
Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo and Birmingham.

Steel Scrap Composites
Average of No. 1 heavy melting steel scrap and No. 2 bundles delivered to consumers at Pittsburgh, Philadelphia and Chicago.

INDEX TO PRICE PAGES

Prices At a Glance 125
Comparison of Prices 129
Bars 138
Billets, Blooms and Slabs 136
Boiler Tubes 140
Bolts, Nuts, Rivets, Screws 141
Clad Steel 140
Coke 140
Electrical Sheets 140
Electrodes 140
Electroplating Supplies 141
Ferroalloys 143
Iron Ore 140
Merchant Wire Products 140
Metal Powders 141
Nonferrous
- Mill Products 135
- Primary Prices 129-134-135
- Remelted Metals 135
- Scrap 135

Piling 136
Pig Iron 142
Pipe and Tubing 139
Plates 138
Rails 140
Refractories 140
Service Center Prices 141
Shapes 136
Sheets 137
Spring Steel 140
Stainless 142
Steel Scrap 132
Strip 136
Structurals 136
Tinplate 137
Tool Steel 140
Track Supplies 140
Water Pipe Index 141
Wire 138
Wire Rod 137

All-State's JET FLUX® and JET FLUX DISPENSER® on production line at Griggs Manufacturing Co. Acetylene and Jet Flux mixed and fed automatically from Dispenser.

to get the best joint, use the right

FLUX

you name it—ALL-STATE has it

ALL-STATE makes quality fluxes for torch and soldering iron applications on all commercial metals . . . in the form you prefer: liquid, paste, powder, flux cored solders, flux coated rods. Working temperatures range from 300F to 2200F. Designed for maximum wetting action, minimum fuming. For instance:

DUZALL . . . a new liquid flux for all soft solders, all metals (except light metals). DUZALL eliminates pre-cleaning, increases capillary action, leaves minimum deposit. Comes in handy 4 oz. refillable dispenser-type plastic containers, and in larger units.

#11 BRAZALOY® . . . a paste or powder flux for use on 14 ferrous and bronze alloys. Wide temperature range: 1200F to 2200F. Non-corrosive, non-fuming. Also available extruded on Nickel Silver welding rods.

#31 BRAZALOY® . . . a highly active aluminum brazing flux that gives maximum wetting action, excellent capillary flow. Protects surfaces from discoloration, requires less after-cleaning. An outstanding temperature indicator.

S200 SILVER BRAZING FLUX . . . melts at 600F, becomes transparent at 1100F, protects heated base metal to 1800F. Induces excellent capillary action and flow of silver alloys.

Send for free copy of 54-page Instruction Manual and for information on custom coating your welding rods.

Distributor-Stocked, convenient to buy. Economical to use.

ALL-STATE WELDING ALLOYS CO., INC., White Plains, N. Y.

Call WHite Plains 8-4646 or write for nearest distributor

Optimism Weakens In Dull Market

Lack of strong mill buying is starting to depress dealer morale in some areas.

Buyers are purchasing carefully, spreading out orders to hold prices down.

■ The market is still bullish, but some bearish overtones are creeping in.

In most districts mills are not pushing for scrap. This lack of activity is depressing dealer morale. As yet, however, the dealers are not unloading tonnages. Most are hoping for better prices.

Buyers are selective on purchases and insisting on high-quality tonnages. Many purchases are moving to mills on old orders at prevailing prices. In some cases, the mills are spreading out buys to keep prices from moving up.

The most active market is the Midwest. Steelmaking grades there are stronger. At Chicago out-of-the-area purchases at higher prices confirmed local buys at new levels. With no change at Philadelphia or Pittsburgh the IRON AGE No. 1 Heavy Melting Composite went up slightly to $41.83.

Pittsburgh — Market remains quiet, but firm. As yet, there's not enough general buying to bring a real price surge. So far, the mills have been able to spread purchases to avoid pushing prices up. There's a general feeling a long period of market stability may be due. Right now, substantial tonnages of scrap are moving on old orders. Higher prices are pulling some scrap out of the district. This applies especially to yards which have high freight rates to local mills.

Chicago — Steelmaking grades strengthened after purchases were confirmed by out-of-the-area mill buying at a stronger level. No. 1 heavy melting went up $1 to $40 to $41. No. 2 heavy melting also moved up $1 to $37 to $38. Railroads continue to hold scrap off the market hoping for price increases. Generally, the market is firm with few increases reported in electric furnace and blast furnace grades.

Philadelphia—A bearish sentiment is slowly creeping back into the market. Domestic mills aren't pushing for scrap and lack of active buying is having its effect on dealer morale. However, while export buying is slowing, higher export prices continue to act as a floor under present domestic prices. When one mill went out of the market for No. 2 bundles, another came in at the same price. A dual price still exists for No. 1 bundles and busheling.

New York—The market continues firm. Mills are trying to resist price increases. Export sales, however, are providing upward pressure. No. 2 bundles slipped down $1 a ton to $20 to $21. Other prices are unchanged.

Detroit—There's virtually no action in the market. Dealers are sitting on their hands and hoping for more orders. Although steel mills are operating at full capacity, they are dipping into inventories. Some are buying industrial scrap. With auto production generating a high rate of scrap, the area may be a plus scrap market for another month or two.

Cleveland — The market tone continues good. However buyers are highly selective and quality conscious. With mill buying restricted, regular dealers have difficulty finding a home for their scrap. Steelmaking grades are in the greatest demand. Blast furnace grades are starting to back up again.

St. Louis—The market is strong, but most prices are unchanged. The scrap flow has improved and more tonnage is moving to mills. Strong demand pushed up cast iron borings by $2 to $26 to $27. Machine shop turnings advanced $1 to $20 to $21. Shoveling turnings are also up $1 to $22 to $23.

Cincinnati—Dealers are less bullish than they were a week ago. The market continues slow. Generally, the dealers are reluctant to sell, hoping for moderately higher prices. With market activity absent, prices held unchanged at last week's levels.

Birmingham — Brokers in this area expect only flutters of buying during the rest of the month. At present, buying is spotty, although the market is firm. A large cast iron pipe manufacturer has returned to the market for sizable purchases.

Buffalo — Prices are firm, although the market is inactive. A sizable tonnage of No. 1 cupola cast went at $2 less than old prices.

Boston — The market remains quiet. There is very little domestic activity. Export is in about the same status, with little going on. No. 2 heavy melting rose $1 to $25 to $26. Machine shop turnings dropped $1 to $12.50 to $13.50.

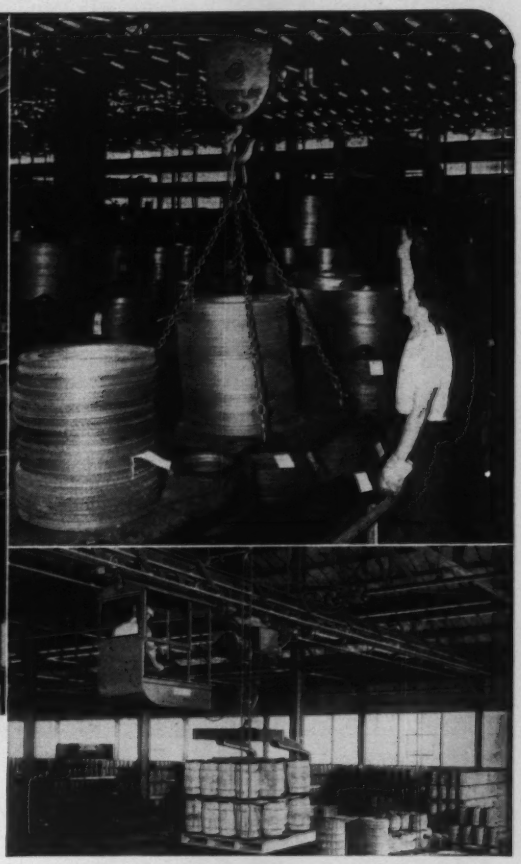
West Coast—Up and down the Coast, the market is uniformly dull. Most dealers look for a quiet February. Export is the single active element in the market at the moment. Prices are steady, although a bit on the soft side.

Houston—The market has quieted down since a district mill came in for its January tonnages last week. The cast market continues to show weakness because of a falloff in foundry business.

CRANES *SPEED* PALLET-HANDLING

Store More—Eliminate Congestion—Cut Maintenance—Save Floors

Pallets loaded with motor stator laminations are easily lifted and moved with these floor-operated Tramrail cranes. Note that the entire area is jam-packed, with no lost aisle-way space. The ease with which any loaded pallet can be picked up and handled to awkward-to-reach places is a distinct advantage.



Pallets with 32 100-lb. kegs of nails are piled high in storage with the cab-operated Tramrail crane and open-side pallet lift.

THERE'S no height limit when stacking palleted materials with Tramrail cranes. 20 ft.—30 ft.—40 ft. or higher are easy. Your materials and building are the only limiting factors.

Often 50% and more materials on pallets can be stored in a room served by overhead cranes. Narrowing of some aisles, elimination of others, plus higher and closer piling make the difference.

Pallet loads are moved safely and speedily overhead where the path is always clear and unobstructed. Placing this handling job near the ceiling, reduces floor congestion and frees much of it for other purposes.

Maintenance costs for Tramrail cranes are extremely low, usually only a few percent of that for power-operated floor trucks. No engines to overhaul. No clutches to replace. No brakes to re-line. No batteries to charge. No irritating gas fumes. And of importance, extra heavily reinforced floors are not required and costly floor damage because of materials handling is eliminated.

When considering pallet handling or any materials handling, it will pay you to look into the tremendous advantages that Cleveland Tramrail cranes offer.

GET THIS BOOK!

BOOKLET No. 2008. Packed with valuable information. Profusely illustrated. Write for free copy

CLEVELAND TRAMRAIL DIVISION
THE CLEVELAND CRANE & ENGINEERING CO.
4878 EAST 284 ST. WICKLIFFE, OHIO

CLEVELAND TRAMRAIL
OVERHEAD MATERIALS HANDLING EQUIPMENT

SCRAP PRICES *(Effective Jan. 19, 1960)*

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Pittsburgh

No. 1 hvy. melting	$43.00 to $44.00
No. 2 hvy. melting	36.00 to 37.00
No. 1 dealer bundles	45.00 to 46.00
No. 1 factory bundles	50.00 to 51.00
No. 2 bundles	31.00 to 32.00
No. 1 busheling	43.00 to 44.00
Machine shop turn.	25.00 to 26.00
Shoveling turnings	30.00 to 31.00
Cast iron borings	29.00 to 30.00
Low phos. punch'gs plate	52.00 to 53.00
Heavy turnings	37.00 to 38.00
No. 1 RR hvy. melting	49.00 to 50.00
Scrap rails, random lgth.	60.00 to 61.00
Rails 2 ft and under	64.00 to 65.00
RR specialties	57.00 to 58.00
No. 1 machinery cast	55.00 to 56.00
Cupola cast	50.00 to 51.00
Heavy breakable cast	48.00 to 49.00
Stainless	
18-8 bundles and solids	235.00 to 240.00
18-8 turnings	115.00 to 120.00
430 bundles and solids	130.00 to 135.00
410 turnings	60.00 to 65.00

Chicago

No. 1 hvy. melting	$40.00 to $41.00
No. 2 hvy. melting	37.00 to 38.00
No. 1 dealer bundles	41.00 to 42.00
No. 1 factory bundles	46.00 to 47.00
No. 2 bundles	27.00 to 28.00
No. 1 busheling	40.00 to 41.00
Machine shop turn.	23.00 to 24.00
Mixed bor. and turn.	25.00 to 26.00
Shoveling turnings	25.00 to 26.00
Cast iron borings	25.00 to 26.00
Low phos. forge crops	55.00 to 56.00
Low phos. punch'gs plate, ¼ in. and heavier	52.00 to 53.00
Low phos. 2 ft and under	50.00 to 51.00
No. 1 RR hvy. melting	45.00 to 46.00
Scrap rails, random lgth.	57.00 to 58.00
Rerolling rails	64.00 to 65.00
Rails 2 ft and under	63.00 to 64.00
Angles and splice bars	55.00 to 56.00
RR steel car axles	60.00 to 61.00
RR couplers and knuckles	52.00 to 53.00
No. 1 machinery cast	60.00 to 61.00
Cupola cast	53.00 to 54.00
Cast iron wheels	48.00 to 49.00
Malleable	62.00 to 63.00
Stove plate	50.00 to 51.00
Steel car wheels	51.00 to 52.00
Stainless	
18-8 bundles and solids	220.00 to 225.00
18-8 turnings	120.00 to 125.00
430 bundles and solids	120.00 to 125.00
430 turnings	60.00 to 65.00

Philadelphia Area

No. 1 hvy. melting	$41.00 to $42.00
No. 2 hvy. melting	37.00 to 38.00
No. 1 dealer bundles	45.00 to 47.00
No. 2 bundles	25.00 to 26.00
No. 1 busheling	45.00 to 47.00
Machine shop turn.	22.00 to 23.00
Mixed bor. short turn.	23.00 to 24.00
Cast iron borings	22.00 to 23.00
Shoveling turnings	25.00 to 26.00
Clean cast. chem. borings	27.00 to 28.00
Low phos. 5 ft and under	48.00 to 49.00
Low phos. 2 ft punch'gs	50.00 to 51.00
Elec. furnace bundles	48.00 to 49.00
Heavy turnings	34.00 to 35.00
RR specialties	50.00 to 51.00
Rails, 18 in. and under	67.00 to 68.00
Cupola cast	42.00 to 43.00
Heavy breakable cast	46.00 to 47.00
Cast iron car wheels	50.00 to 51.00
Malleable	67.00 to 68.00
No. 1 machinery cast	54.00 to 55.00

Cincinnati

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$36.00 to $37.00
No. 2 hvy. melting	30.00 to 31.00
No. 1 dealer bundles	36.00 to 37.00
No. 2 bundles	25.00 to 26.00
Machine shop turn.	20.00 to 21.00
Shoveling turnings	22.00 to 23.00
Cast iron borings	20.00 to 21.00
Low phos. 18 in. and under	48.00 to 49.00
Rails, random length	54.00 to 55.00
Rails, 18 in. and under	62.00 to 63.00
No. 1 cupola cast	49.00 to 50.00
Hvy. breakable cast	44.00 to 45.00
Drop broken cast	59.00 to 60.00

Youngstown

No. 1 hvy. melting	$47.00 to $48.00
No. 2 hvy. melting	39.00 to 40.00
No. 1 dealer bundles	47.00 to 48.00
No. 2 bundles	29.00 to 30.00
Machine shop turn.	20.50 to 21.50
Shoveling turnings	25.50 to 26.50
Low phos. plate	48.00 to 49.00

Cleveland

No. 1 hvy. melting	$43.50 to $44.50
No. 2 hvy. melting	35.50 to 36.50
No. 1 dealer bundles	43.50 to 44.50
No. 1 factory bundles	46.50 to 47.50
No. 2 bundles	25.50 to 26.50
No. 1 busheling	43.50 to 44.50
Machine shop turn.	18.00 to 19.00
Mixed bor. and turn.	23.00 to 24.00
Shoveling turnings	23.00 to 24.00
Cast iron borings	23.00 to 24.00
Cut structural & plates, 2 ft & under	48.50 to 49.50
Drop forge flashings	43.50 to 44.50
Low phos. punch'gs plate	44.50 to 45.50
Foundry steel, 2 ft & under	43.00 to 44.00
No. 1 RR hvy. melting	47.50 to 48.50
Rails 2 ft and under	65.00 to 66.00
Rails 18 in. and under	66.00 to 67.00
Steel axle turnings	24.00 to 25.00
Railroad cast	60.00 to 61.00
No. 1 machinery cast	56.00 to 57.00
Stove plate	51.00 to 52.00
Malleable	67.00 to 68.00
Stainless	
18-8 bundles	215.00 to 225.00
18-8 turnings	100.00 to 110.00
430 bundles	120.00 to 125.00

Buffalo

No. 1 hvy. melting	$36.00 to $37.00
No. 2 hvy. melting	33.00 to 34.00
No. 1 busheling	36.00 to 37.00
No. 1 dealer bundles	36.00 to 37.00
No. 2 bundles	26.00 to 27.00
Machine shop turn.	19.00 to 20.00
Mixed bor. and turn.	20.00 to 21.00
Shoveling turnings	23.00 to 24.00
Cast iron borings	20.00 to 21.00
Low phos. plate	44.00 to 45.00
Structurals and plate, 2 ft and under	44.00 to 45.00
Scrap rails, random lgth.	42.00 to 43.00
Rails 2 ft and under	52.00 to 53.00
No. 1 machinery cast	51.00 to 52.00
No. 1 cupola cast	47.00 to 48.00

St. Louis

No. 1 hvy. melting	$36.00 to $37.00
No. 2 hvy. melting	34.00 to 35.00
No. 1 dealer bundles	42.00 to 43.00
No. 2 bundles	26.00 to 27.00
Machine shop turn.	20.00 to 21.00
Shoveling turnings	22.00 to 23.00
Cast iron borings	26.00 to 27.00
No. 1 RR hvy. melting	44.00 to 45.00
Rails, random lengths	52.00 to 53.00
Rails, 18 in. and under	57.00 to 58.00
Angles and splice bars	50.00 to 51.00
RR specialties	49.00 to 50.00
Cupola cast	53.00 to 54.00
Heavy breakable cast	45.00 to 46.00
Stove plate	44.00 to 45.00
Cast iron car wheels	48.50 to 49.50
Rerolling rails	60.00 to 61.00
Unstripped motor blocks	45.00 to 46.00

Birmingham

No. 1 hvy. melting	$36.00 to $37.00
No. 2 hvy. melting	30.00 to 31.00
No. 1 dealer bundles	36.00 to 37.00
No. 2 bundles	25.00 to 26.00
No. 1 busheling	40.00 to 41.00
Machine shop turn.	23.00 to 24.00
Shoveling turnings	25.00 to 26.00
Cast iron borings	14.00 to 15.00
Electric furnace bundles	40.00 to 41.00
Elec. furnace, 3 ft & under	38.00 to 39.00
Bar crops and plate	44.00 to 45.00
Structural and plate, 2 ft	44.00 to 45.00
No. 1 RR hvy. melting	39.00 to 40.00
Scrap rails, random lgth.	53.00 to 54.00
Rails, 18 in. and under	57.00 to 58.00
Angles and splice bars	49.00 to 50.00
Rerolling rails	61.00 to 62.00
No. 1 cupola cast	53.00 to 54.00
Stove plate	53.00 to 54.00
Cast iron car wheels	45.00 to 46.00
Unstripped motor blocks	42.00 to 43.00

New York

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$35.00 to $36.00
No. 2 hvy. melting	30.00 to 31.00
No. 2 dealer bundles	20.00 to 21.00
Machine shop turnings	11.00 to 12.00
Mixed bor. and turn.	12.00 to 13.00
Shoveling turnings	15.00 to 16.00
Clean cast. chem. borings	22.00 to 23.00
No. 1 machinery cast	39.00 to 40.00
Mixed yard cast	37.00 to 38.00
Heavy breakable cast	37.00 to 38.00
Stainless	
18-8 prepared solids	200.00 to 205.00
18-8 turnings	85.00 to 90.00
430 prepared solids	85.00 to 90.00
430 turnings	20.00 to 25.00

Detroit

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$37.00 to $38.00
No. 2 hvy. melting	25.00 to 26.00
No. 1 dealer bundles	39.00 to 40.00
No. 2 bundles	20.00 to 21.00
No. 1 bushelings	37.00 to 38.00
Drop forge flashings	37.00 to 38.00
Machine shop turn.	16.00 to 17.00
Mixed bor. and turn.	18.00 to 19.00
Shoveling turnings	18.00 to 19.00
Cast iron borings	21.00 to 22.00
Heavy breakable cast	40.00 to 41.00
Mixed cupola cast	47.00 to 48.00
Automotive cast	51.00 to 52.00
Stainless	
18-8 bundles and solids	210.00 to 215.00
18-8 turnings	80.00 to 85.00
430 bundles and solids	105.00 to 110.00

Boston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$35.00 to $36.00
No. 2 hvy. melting	25.00 to 26.00
No. 1 dealer bundles	35.00 to 36.00
No. 2 bundles	18.00 to 19.00
No. 1 busheling	35.00 to 36.00
Machine shop turn.	12.50 to 13.50
Shoveling turnings	16.50 to 17.50
Clean cast. chem. borings	16.50 to 17.50
No. 1 machinery cast	41.00 to 42.00
Mixed cupola cast	35.00 to 36.00
Heavy breakable cast	35.50 to 36.50

San Francisco

No. 1 hvy. melting	$40.00
No. 2 hvy. melting	36.00
No. 1 dealer bundles	36.00
No. 2 bundles	22.00
Machine shop turn.	$17.00 to 19.00
Cast iron borings	17.00 to 19.00
No. 1 cupola cast	48.00

Los Angeles

No. 1 hvy. melting	$41.00
No. 2 hvy. melting	35.00
No. 1 dealer bundles	36.00
No. 2 bundles	20.00
Machine shop turn.	$18.00 to 19.00
Shoveling turnings	18.00 to 19.00
Cast iron borings	18.00 to 19.00
Elec. furn. 1 ft and under (foundry)	49.00 to 50.00
No. 1 cupola cast	47.00 to 48.00

Seattle

No. 1 hvy. melting	$35.00
No. 2 hvy. melting	33.00
No. 2 bundles	22.00
No. 1 cupola cast	36.00
Mixed yard cast	36.00

Hamilton, Ont.

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$32.25
No. 2 hvy. melting	28.25
No. 1 dealer bundles	32.25
No. 2 bundles	24.00
Mixed steel scrap	24.25
Bush., new fact., prep'd	32.25
Bush., new fact., unprep'd	26.25
Machine shop turn.	14.00
Short steel turn.	17.00
Mixed bor. and turn.	13.00
Cast scrap	$46.50 to 48.00

Houston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$39.00
No. 2 hvy. melting	36.00
No. 2 bundles	26.00
Machine shop turn.	16.00
Shoveling turnings	20.00
Cut structural plate 2 ft & under	$47.00 to 48.00
Unstripped motor blocks	36.50 to 37.50
Cupola cast	44.00 to 45.00
Heavy breakable cast	34.00 to 35.00

for the purchase or sale of **scrap**

Luria Brothers and Company, Inc.

main office **CHRYSLER BUILDING EAST,** *New York, N. Y.*

PLANTS

READING, PENNA. MODENA, PENNA.

OFFICES

BIRMINGHAM, ALA.	CLEVELAND, OHIO	LOS ANGELES, CAL.	PUEBLO, COLORADO
BOSTON, MASS.	DETROIT, MICHIGAN	MEMPHIS, TENN.	READING, PENNA.
BUFFALO, N. Y.	HOUSTON, TEXAS	NEW YORK, N. Y.	ST. LOUIS, MISSOURI
CHICAGO, ILLINOIS	KOKOMO, INDIANA	PITTSBURGH, PENNA.	SAN FRANCISCO, CAL.
CINCINNATI, OHIO	LEBANON, PENNA.	PHILADELPHIA, PA.	SEATTLE, WASH.

In Canada MONTREAL, QUEBEC—HAMILTON, ONTARIO

IMPORT & EXPORT — LIVINGSTON & SOUTHARD, INC., CHRYSLER BUILDING EAST, NEW YORK, N. Y. • 5950 S. BOYLE AVE., LOS ANGELES 58, CAL. • *Cable Address:* FORENTRACO

Lead-Zinc Imports Are Weighed

Tariff Commission hears both sides on effects of imports on domestic markets.

Election year, other factors, make some moderate action likely.

▪ There may be some general tightening up on imports of lead and zinc. This could be more restrictive quotas, higher tariffs, or a combination of both.

And there might even be an easing in a few other areas.

This is a general conclusion based on the recent hearings held by the U. S. Tariff Commission. The Senate had requested the Commission to investigate to see what should be done to put the domestic lead and zinc industry "on a sound and stable basis."

Hard to Tell—For the most part, the arguments were similar, for and against the same things, to the hearings almost three years ago. It was far from a case of right or wrong. Observers from the trade, as well as branches of government, weren't eager to predict what the six-man Tariff Commission would recommend.

But it was clear that there are some new factors this time that could influence the decision of the Commission, and subsequent action.

First of all, this is an election year. The hearings lead off with a parade of Senators and Representatives who told how bad things were with lead-zinc companies back home, and demanding action.

Quotas Unpopular—Also, this is the first real opportunity for all segments of industry to state their views since the quotas, proclaimed in September 1958, could be appraised. Few, if any, industry people were for quotas then. Nor are they now.

Miles P. Romney, chairman of the Emergency Lead-Zinc Committee, summed up the miners' and small smelters' side of the issue. He introduced statistics to show quotas haven't helped the domestic lead industry at all, and zinc only slightly, if at all. There is no doubt that his statement impressed the Commission.

Mr. Romney said the ELZ committee "preferred import taxes as the method of controlling excessive imports." He suggested 4¢ per lb when the U. S. price of lead drops below 15½¢ per lb, and zinc below 13½¢ per lb.

More Likely—Mr. Romney indicated a secondary preference for flexible quotas, or a combination higher tariff—stiffer quota plan. Either is a more likely choice of the Commission.

The problem of manufactured lead and zinc slipping into the country through loopholes in the quotas (a new problem) pretty well fizzled. Early in the week the hearings were buzzing about the case of the agricultural wheels imported from Mexico by a Texas fabricator and finding their way to a U. S. mill to be rolled into other shapes. But later in the week it turned out the wheels, despite being a "manufactured shape" came in under quota.

Watch the Competition — The case for the large smelters, many of whom import ore and concentrates, was made by Simon Strauss, vice president, American Smelting & Refining Co. He warned against legislating prices of lead and zinc right out of the market. He warned other metals and materials were ready and able to take markets away if import taxes, consequently prices, went much higher.

Some of the smelters were violently opposed to quotas. But they've learned to live with them.

Diecasters' Trouble—One spot where quotas may be eased is on special high grade zinc, used by diecasters. The testimony and remarks of David Laine, secretary of the American Diecasting Institute indicated diecasters have only about 10-days inventory of special high grade zinc. Auto builders, diecasters biggest market, are sharply increasing their buying. Yet casters find almost half of their normal pipeline filled. Historically, 40 pct of the domestic supply of special high grade zinc is imported, and no more can come in for a quarter once quotas are used up.

Tin prices for the week: Jan. 13—99.50; Jan. 14—99.50; Jan. 15—99.625; Jan. 18—100.00; Jan. 19—100.00.*

*Estimate.

Primary Prices

(cents per lb)	current price	last price	date of change
Aluminum pig	26.00	24.70	12/17/59
Aluminum Ingot	28.10	26.80	12/17/59
Copper (E)	33.00	30-33	11/12/59
Copper (CS)	35.00	33.00	12/23/59
Copper (L)	33.00	31.50	11/6/59
Lead, St. L.	11.80	12.30	12/21/59
Lead, N. Y	12.00	12.50	12/21/59
Magnesium Ingot	36.00	34.50	8/13/56
Magnesium pig	35.25	33.75	8/13/56
Nickel	74.00	64.50	12/6/58
Titanium sponge	150-160	162-182	8/1/59
Zinc, E. St. L.	13.00	12.50	1/8/60
Zinc, N. Y.	13.50	13.00	1/8/60

ALUMINUM: 99% Ingot COPPER: (E) = electrolytic, (CS) = custom smelters, electrolytic. (L) = lake. LEAD: common grade. MAGNESIUM: 99.8% pig Velasco, Tex. NICKEL: Port Colborne, Canada. ZINC: prime western. TIN: See above; Other primary prices. pg. 135.

MILL PRODUCTS

(Cents per lb unless otherwise noted)

ALUMINUM

(Base 30,000 lb, f.o.b. customer's plant)

Flat Sheet (Mill Finish and Plate)

("F" temper except 6061-0)

Alloy	.032	.081	.136 .249	.250- 3.
1100, 3003	45.7	43.8	42.8	43.3
5052	53.1	48.4	46.9	46.0
6061-0	50.1	45.7	43.9	44.9

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
6- 8	42.7-44.2	51.1-54.8
12-14	42.7-44.2	52.0-56.5
24-26	43.2-44.7	62.8-67.5
36-38	46.7-49.2	86.9-90.5

Screw Machine Stock—2011-T-3

Size"	¼	⅜-⅝	¾-1	1¼-1½
Price	62.0	61.2	59.7	57.3

Roofing Sheet, Corrugated

(Per sheet, 26" wide base, 16,000 lb)

Length"→	72	96	120	144
.019 [illegible]	$1.411	$1.884	$2.353	$2.823
.[illegible]e	1.762	2.349	2.937	3.524

MAGNESIUM

(F.o.b. shipping pt., carload frt. allowed)

Sheet and Plate

Type↓ Gage→	.250 3.00	.250- 2.00	.188	.081	.032
AZ31B Stand. Grade	.....	67.9	69.0	77.9	103.1
AZ31B Spec.	.....	93.3	96.9	108.7	171.3
Tread Plate	.....	70.6	71.7	.....	.....
Tooling Plate	73.0	.....	.....	.....	.....

Extruded Shapes

factor→	6-8	12-14	24-26	36-38
Comm. Grade. (AZ31C)	65.3	65.3	66.1	71.5
Spec. Grade... (AZ31B)	84.6	85.7	90.6	104.2

Alloy Ingot

AZ91B (Die Casting) ..... 37.25 (delivered)
AZ63A, AZ92A, AZ91C (Sand Casting) 40.75 (Velasco, Tex.)

NICKEL, MONEL, INCONEL

(Base prices f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	138	120	138
Strip, CR	124	108	138
Rod, bar, HR	107	89	109
Angles, HR	107	89	109
Plates, HR	130	110	126
Seamless tube	157	129	200
Shot, blocks	...	87	...

COPPER, BRASS, BRONZE

(Freight included in 5000 lbs)

	Sheet	Wire	Rod	Tube
Copper	57.13	.....	54.86	58.32
Brass, Yellow	50.57	50.86	50.26	54.23
Brass, Low	53.53	53.82	53.22	57.09
Brass, R L	54.58	54.87	54.27	58.14
Brass, Naval	55.12	.....	48.68	58.78
Muntz Metal	53.20	.....	48.26	.....
Comm. Bz.	56.17	56.46	55.86	59.48
Mang. Bz.	58.86	.....	52.21	.....
Phos. Bz. 5%	77.44	.....	78.19	.....

Free Cutting Brass Rod 36.06

TITANIUM

(Base prices f.o.b. mill)

Sheet and strip, commercially pure, $7.25-$8.50; alloy, $13.40-$17.00. Plate, HR, commercially pure, $5.25-$6.00; alloy, $8.00-$10.00. Wire, rolled and/or drawn, commercially pure, $5.55-$6.05; alloy, $7.55-$9.50; Bar, HR or forged, commercially pure, $4.00-$4.50; alloy, $4.00-$6.25; billets, HR, commercially pure, $3.20-$3.70; alloy, $3.20-$4.75.

PRIMARY METAL

(Cents per lb unless otherwise noted)

Antimony, American, Laredo, Tex.. 29.50
Beryllium Aluminum 5% Be, Dollar per lb contained Be $74.75
Beryllium copper, per lb conta'd Be. $43.00
Beryllium 97% lump or beads, f.o.b. Cleveland, Reading $71.50
Bismuth, ton lots ..... $ 2.25
Cadmium, del'd ..... $ 1.40
Calcium, 99.9% small lots ..... $ 4.55
Chromium, 99.8% metallic base ... $ 1.31
Cobalt, 97-99% (per lb) ... $1.75 to $1.82
Germanium, per gm, f.o.b. Miami, Okla., refined ..... 33.30 to 42.00
Gold, U. S. Treas., per troy oz.... $35.00
Indium, 99.9%, dollars per troy oz. $ 2.25
Iridium, dollars per troy oz... $75 to $85
Lithium, 98% ..... $11.00 to $14.00
Magnesium sticks, 10,000 lb. 57.00
Mercury, dollars per 76-lb flask f.o.b. New York ..... $211 to $213
Nickel oxide sinter at Buffalo, N. Y., or other U. S. points of entry, contained nickel 69.60
Palladium, dollars per troy oz.. $24 to $26
Platinum, dollars per troy oz.. $77 to $80
Rhodium ..... $137 to $140
Silver ingots (¢ per troy oz.) 91.375
Thorium, per kg. $43.00
Vanadium ..... $ 3.45
Zirconium sponge ..... $ 5.00

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5 ingot
- No. 115 ..... 30.75
- No. 120 ..... 29.25
- No. 123 ..... 28.75

80-10-10 ingot
- No. 305 ..... 35.25
- No. 315 ..... 33.00

88-10-2 ingot
- No. 210 ..... 44.00
- No. 215 ..... 40.75
- No. 245 ..... 36.00

Yellow ingot
- No. 405 ..... 24.75

Manganese bronze
- No. 421 ..... 29.25

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys
- 0.30 copper max. 26.25-26.50
- 0.60 copper max. 26.00-26.25

Piston alloys (No. 132 type)... 28.00-29.00
No. 12 alum. (No. 2 grade)... 24.75-25.25
108 alloy 25-25.75
195 alloy 27.75-28.75
13 alloy (0.60 copper max.)... 26.00-26.25
AXS-679 (1 pct zinc) 25.00-26.00

Steel deoxidizing aluminum notch bar granulated or shot
- Grade 1—95-97½% 25.25-26.25
- Grade 2—92-95% 24.00-25.00
- Grade 3—90-92% 23.00-24.00
- Grade 4—85-90% 22.50-23.50

(Effective Jan. 18, 1960)

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	29	28¾
Yellow brass	22¼	20¼
Red brass	25¾	25
Comm. bronze	26¼	26
Mang. bronze	20¾	20
Free cutting rod ends.	21¼	

Customs Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

- No. 1 copper wire 29¾
- No. 2 copper wire 26½
- Light copper 24¼
- *Refinery brass 24¾
- Copper bearing material 24

*Dry copper content.

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

- No. 1 copper wire 27½
- No. 2 copper wire 26
- Light copper 24
- No. 1 composition 23
- No. 1 comp. turnings 22½
- Hvy. yellow brass solids 16¾
- Brass pipe 16¼
- Radiators 18

Aluminum

- Mixed old cast. ..... 14½—15½
- Mixed new clips ..... 17 —17½
- Mixed turnings, dry ..... 15 —16

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Copper and Brass

- No. 1 copper wire ..... 26 —26½
- No. 2 copper wire ..... 23 —23½
- Light copper ..... 21½—22
- Auto radiators (unsweated). 14½—15
- No. 1 composition ..... 18½—19
- No. 1 composition turnings... 17 —17½
- Cocks and faucets ..... 15 —15½
- Clean heavy yellow brass ... 13 —13½
- Brass pipe ..... 15 —15½
- New soft brass clippings .... 15¼—15¾
- No. 1 brass rod turnings .... 12½—13

Aluminum

- Alum. pistons and struts .... 7½— 8
- Aluminum crankcase ..... 11¼—11¾
- 1100 (2s) aluminum clippings 15 —15½
- Old sheet and utensils ..... 11¼—11¾
- Borings and turnings ..... 7 — 7½
- Industrial castings ..... 11¼—11¾
- 2020 (24S) clippings ..... 12½—13

Zinc

- New zinc clippings ..... 7 — 7¼
- Old zinc ..... 4½— 5
- Zinc routings ..... 3¼— 3½
- Old die cast scrap ..... 2¾— 3

Nickel and Monel

- Pure nickel clippings 52-54
- Clean nickel turnings 40
- Nickel anodes 52-54
- Nickel rod ends 52-54
- New Monel clippings 28-29
- Clean Monel turnings 20-23
- Old sheet Monel 24-26
- Nickel silver clippings, mixed 18
- Nickel silver turnings, mixed 15

Lead

- Soft scrap lead ..... 8 — 8¼
- Battery plates (dry) ..... 3 — 3¼
- Batteries, acid free ..... 2 — 2¼

Miscellaneous

- Block tin ..... 75 —76
- No. 1 pewter ..... 55 —56
- Auto babbitt ..... 39 —40
- Mixed common babbitt ..... 9¾—10¼
- Solder joints ..... 13¼—13¾
- Siphon tops 41
- Small foundry type ..... 9¾—10¼
- Monotype ..... 9¾—10¼
- Lino. and stereotype ..... 8¾— 9
- Electrotype ..... 7½— 7¾
- Hand picked type shells .... 5½— 5¾
- Lino. and stereo. dross ..... 2¼— 2¾
- Electro dross ..... 2¼— 2¾

IRON AGE

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BILLETS, BLOOMS, SLABS			PILING	SHAPES STRUCTURALS			STRIP					
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide-Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			$119.00 *B3*		5.55 *B3*	8.10 *B3*	5.55 *B5*						
	Buffalo, N. Y.	$80.00 *R3, B3*	$99.50 *R3, B3*	$119.00 *R3, B3*	6.50 *B3*	5.55 *B3*	8.10 *B3*	5.55 *B3*	5.10 *B3*	7.425 *S10, R7*	7.575 *B3*			
	Phila., Pa.									7.875 *P15*				
	Harrison, N. J.													15.55 *C11*
	Conshohocken, Pa.		$104.50 *A2*	$126.00 *A2*					5.15 *A2*		7.575 *A2*			
	New Bedford, Mass.									7.875 *R6*				
	Johnstown, Pa.	$80.00 *B3*	$99.50 *B3*	$119.00 *B3*		5.55 *B3*	8.10 *B3*							
	Boston, Mass.									7.975 *T8*				
	New Haven, Conn.									7.875 *D1*				
	Baltimore, Md.									7.425 *T8*				15.90 *T8*
	Phoenixville, Pa.					5.55 *P2*		5.55 *P2*						
	Sparrows Pt., Md.								5.10 *B3*		7.575 *B3*			
	New Britain, Bridgeport, Wallingford, Conn.			$119.00 *N8*						7.875 *W1,S7*				
	Pawtucket, R. I. Worcester, Mass.									7.975 *N7, A5*				15.90 *N7* 15.70 *T8*
MIDDLE WEST	Alton, Ill.								5.30 *L1*					
	Ashland, Ky.								5.10 *A7*		7.575 *A7*			
	Canton-Massillon, Dover, Ohio		$102.00 *R3*	$119.00 *R3,* $114.00 *T5*						7.425 *G4*		10.80 *G4*		
	Chicago, Franklin Park, Evanston, Ill.	$80.00 *U1, R3*	$99.50 *U1, R3,W8*	$119.00 *U1, R3,W8*	6.50 *U1*	5.50 *U1, W8,P13*	8.05 *U1, Y1,W8*	5.50 *U1*	5.10 *W8, N4,A1*	7.525 *A1,T8, M8*	7.575 *W8*		8.40 *W8, S9,I3*	15.55 *A1, S9,G4,T8*
	Cleveland, Ohio									7.425 *A5,J3*		10.75 *A5*	8.40 *J3*	
	Detroit, Mich.			$119.00 *R5*					5.10 *G3, M2*	7.425 *M2, S1, D1,P11*	7.575 *G3*	10.80 *S1*		
	Anderson, Ind.									7.425 *G4*				
	Gary, Ind. Harbor, Indiana	$80.00 *U1*	$99.50 *U1*	$119.00 *U1, Y1*		5.50 *U1, I3*	8.05 *U1, J3*	5.50 *I3*	5.10 *U1, I3,Y1*	7.425 *Y1*	7.575 *U1, I3,Y1*	10.90 *Y1*	8.40 *U1, Y1*	
	Sterling, Ill.	$80.00 *N4*				5.50 *N4*	7.75 *N4*	5.50 *N4*	5.20 *N4*					
	Indianapolis, Ind.									7.575 *R5*				15.70 *R5*
	Newport, Ky.								5.10 *A9*				8.40 *A9*	
	Niles, Warren, Ohio Sharon, Pa.		$99.50 *S1,* $\frac{1}{2}$ *C10*	$119.00 *C10,S1*					5.10 *R3, S1*	7.425 *R3, T4,S1*	7.575 *R3, S1*	10.80 *R3, S1*	8.40 *S1*	15.55 *S1*
	Owensboro, Ky.	$80.00 *G5*	$99.50 *G5*	$119.00 *G5*										
	Pittsburgh, Midland, Butler, Aliquippa, McKeesport, Pa.	$80.00 *U1, P6*	$99.50 *U1, C11,P6*	$119.00 *U1, C11,B7*	6.50 *U1*	5.50 *U1, J3*	8.05 *U1, J3*	5.50 *U1*	5.10 *P6*	7.425 *J3,B4* 7.525 *E3*			8.40 *S9*	15.55 *S9*
	Weirton, Wheeling, Follansbee, W. Va.				6.50 *U1, W3*	5.50 *W3*		5.50 *W3*	5.10 *W3*	7.425 *W5*	7.575 *W3*	10.80 *W3*		
	Youngstown, Ohio	$80.00 *R3*	$99.50 *Y1, C10*	$119.00 *Y1*			8.05 *Y1*		5.10 *U*	7.425 *Y1,R5*	7.575 *U1, Y1*	10.95 *Y1*	8.40 *U1, Y1*	15.55 *R5, Y1*
WEST	Fontana, Cal.	$90.50 *K1*	$109.00 *K1*	$140.00 *K1*		6.30 *K1*	8.85 *K1*	6.45 *K1*	5.825 *K1*	9.20 *K1*				
	Geneva, Utah		$99.50 *C7*			5.50 *C7*	8.05 *C7*							
	Kansas City, Mo.					5.60 *S2*	8.15 *S2*						8.65 *S2*	
	Los Angeles, Torrance, Cal.		$109.00 *B2*	$139.00 *B2*		6.20 *C7, B2*	8.75 *B2*		5.85 *C7, B2*	9.30 *C1,R5*			9.60 *B2*	17.75 *J3*
	Minnequa, Colo.					5.80 *C6*			6.20 *C6*	9.375 *C6*				
	Portland, Ore.					6.25 *O2*								
	San Francisco, Niles, Pittsburg, Cal.		$109.00 *B2*			6.15 *B2*	8.70 *B2*		5.85 *C7, B2*					
	Seattle, Wash.		$109.00 *B2*			6.25 *B2*	8.80 *B2*		6.10 *B2*					
SOUTH	Atlanta, Ga.					5.70 *A8*			5.10 *A8*					
	Fairfield, Ala. City, Birmingham, Ala.	$80.00 *T2*	$99.50 *T2*			5.50 *T2 R3,C16*	8.05 *T2*		5.10 *T2, R3,C16*		7.575 *T2*			
	Houston, Lone Star, Texas		$104.50 *S2*	$124.00 *S2*		5.60 *S2*	8.15 *S2*						8.65 *S2*	

(Effective Jan. 18, 1960)

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		SHEETS								WIRE ROD	TINPLATE†		
		Hot-rolled 18 ga. & hvyr.	Cold-rolled	Galvanized (Hot-dipped)	Enameling	Long Terne	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.		Cokes* 1.25-lb. base box	Electro** 0.25-lb. base box	Holloware Enameling 29 ga.
EAST	Buffalo, N. Y.	5.10 *B3*	6.275 *B3*				7.525 *B3*	9.275 *B3*		6.40 *W6*	† Special coated mfg. terne deduct 35¢ from 1.25-lb. coke base box price, 0.75 lb./0.25 lb. add 55¢. Can-making quality BLACKPLATE 55 to 128 lb. deduct $2.20 from 1.25 lb. coke base box. * COKES: 1.50-lb. add 25¢. **ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add $1.00. Differential 1.00 lb./0.25 lb. add 65¢.		
	Claymont, Del.												
	Coatesville, Pa.												
	Conshohocken, Pa.	5.15 *A2*	6.325 *A2*				7.575 *A2*						
	Harrisburg, Pa.												
	Hartford, Conn.												
	Johnstown, Pa.									6.40 *B3*			
	Fairless, Pa.	5.15 *U1*	6.325 *U1*				7.575 *U1*	9.325 *U1*			$10.50 *U1*	$9.20 *U1*	
	New Haven, Conn.												
	Phoenixville, Pa.												
	Sparrows Pt., Md.	5.10 *B3*	6.275 *B3*	6.875 *B3*			7.525 *B3*	9.275 *B3*	10.025 *B3*	6.50 *B3*	$10.40 *B3*	$9.10 *B3*	
	Worcester, Mass.									6.70 *A5*			
	Trenton, N. J.												
MIDDLE WEST	Alton, Ill.									6.60 *L1*			
	Ashland, Ky.	5.10 *A7*		6.875 *A7*	6.775 *A7*		7.525 *A7*						
	Canton-Massillon, Dover, Ohio			6.875 *R1, R3*									
	Chicago, Joliet, Ill.	5.10 *W8, A1*					7.525 *U1, W8*			6.40 *A5, R3, W8*			
	Sterling, Ill.									6.50 *N4, K2*			
	Cleveland, Ohio	5.10 *R3, J3*	6.275 *R3, J3*	7.65 *R3**	6.775 *R3*		7.525 *R3, J3*	9.275 *R3, J3*		6.40 *A5*			
	Detroit, Mich.	5.10 *G3, M2*	6.275 *G3, M2*				7.525 *G3*	9.275 *G3*					
	Newport, Ky.	5.10 *A9*	6.275 *A9*										
	Gary, Ind. Harbor, Indiana	5.10 *U1, I3, Y1*	6.275 *U1, I3, Y1*	6.875 *U1, I3*	6.775 *U1, I3, Y1*	7.225 *U1*	7.525 *U1, Y1, I3*	9.275 *U1, Y1*		6.40 *Y1*	$10.40 *U1, Y1*	$9.10 *I3, U1, Y1*	7.85 *U1, Y1*
	Granite City, Ill.	5.20 *G2*	6.375 *G2*	6.975 *G2*								$9.20 *G2*	7.95 *G2*
	Kokomo, Ind.			6.975 *C9*						6.50 *C9*			
	Mansfield, Ohio	5.10 *E2*	6.275 *E2*			7.225 *E2*							
	Middletown, Ohio		6.275 *A7*	6.875 *A7*	6.775 *A7*	7.225 *A7*							
	Niles, Warren, Ohio Sharon, Pa.	5.10 *R3, S1*	6.275 *R3*	6.875 *R3* 7.65 *R3**	6.775 *S1*	7.225 *S1**, *R3*	7.525 *R3, S1*	9.275 *R3,*				$9.10 *R3*	
	Pittsburgh, Midland, Butler, Donora, Aliquippa, McKeesport, Pa.	5.10 *U1, J3, P6*	6.275 *U1, J3, P6*	6.875 *U1, J3* 7.50 *E3**	6.775 *U1*		7.525 *U1, J3*	9.275 *U1, J3*	10.025 *U1, J3*	6.40 *A5, J3, P6*	$10.40 *U1, J3*	$9.10 *U1, J3*	7.85 *U1, J3*
	Portsmouth, Ohio	5.10 *P7*	6.275 *P7*							6.40 *P7*			
	Weirton, Wheeling, Follansbee, W. Va.	5.10 *W3, W5*	6.275 *W3, F3, W5*	6.875 *W3, W5* 7.50 *W3**		7.225 *W3, W5*	7.525 *W3*	9.275 *W3*			$10.40 *W5, W3*	$9.10 *W5, W3*	7.85 *W5*
	Youngstown, Ohio	5.10 *U1, Y1*	6.275 *Y1*	7.50 *J3**	6.775 *Y1*		7.525 *Y1*	9.275 *Y1*		6.40 *Y1*			
WEST	Fontana, Cal.	5.825 *K1*	7.40 *K1*				8.25 *K1*	10.40 *K1*			$11.05 *K1*	$9.75 *K1*	
	Geneva, Utah	5.20 *C7*											
	Kansas City, Mo.									6.65 *S2*			
	Los Angeles, Torrance, Cal.									7.20 *B2*			
	Minnequa, Colo.									6.65 *C6*			
	San Francisco, Niles, Pittsburg, Cal.	5.80 *C7*	7.225 *C7*	7.625 *C7*						7.20 *C7*	$11.05 *C7*	$9.75 *C7*	
SOUTH	Atlanta, Ga.												
	Fairfield, Ala. Alabama City, Ala.	5.10 *T2, R3*	6.275 *T2, R3*	6.875 *T2, R3*	6.775 *T2*					6.40 *T2, R3*	$10.50 *T2*	$9.20 *T2*	
	Houston, Texas									6.65 *S2*			

* Electrogalvanized sheets.

(Effective Jan. 18, 1960)

**7.425 at Sharon-Niles is 7.225

IRON AGE

STEEL PRICES

Italics identify producers listed in key at end of table. **Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.**

		BARS						PLATES				WIRE
		Carbon† Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfr'a. Bright
EAST	Bethlehem, Pa.				6.725 *B3*	9.025 *B3*	8.30 *B3*					
	Buffalo, N. Y.	5.675 *R3,B3*	5.675 *R3,B3*	7.70 *B5*	6.725 *B3,R3*	9.025 *B3,B5*	8.30 *B3*	5.30 *B3*				8.00 *W6*
	Claymont, Del.							5.30 *C4*		7.50 *C4*	7.95 *C4*	
	Coatesville, Pa.							5.30 *L4*		7.50 *L4*	7.95 *L4*	
	Conshohocken, Pa.							5.30 *A2*	6.375 *A2*	7.50 *A2*	7.95 *A2*	
	Harrisburg, Pa.							5.30 *P2*	6.375 *P2*			
	Milton, Pa.	5.825 *M7*	5.825 *M7*									
	Hartford, Conn.			8.15 *R3*		9.325 *R3*						
	Johnstown, Pa.	5.675 *B3*	5.675 *B3*		6.725 *B3*		8.30 *B3*	5.30 *B3*		7.50 *B3*	7.95 *B3*	8.00 *B3*
	Fairless, Pa.	5.825 *U1*	5.825 *U1*		6.875 *U1*							
	Newark, Camden, N. J.			8.10 *W10, P10*		9.20 *W10, P10*						
	Bridgeport, Putnam, Willimantic, Conn.			8.20 *W10* 8.15 *J3*	6.80 *N8*	9.175 *N8*						
	Sparrows Pt., Md.		5.675 *B3*					5.30 *B3*		7.50 *B3*	7.95 *B3*	8.10 *B3*
	Palmer, Worcester, Readville, Mansfield, Mass.			8.20 *B5, C14*		9.325 *A5,B5*						8.30 *A5, W6*
	Spring City, Pa.			8.10 *K4*		9.20 *K4*						
MIDDLE WEST	Alton, Ill.	5.875 *L1*										8.20 *L1*
	Ashland, Newport, Ky.							5.30 *A7,A9*		7.50 *A9*	7.95 *A7*	
	Canton, Massillon, Mansfield, Ohio	6.15* *R3*		7.65 *R3,R2*	6.725 *R3* 6.475 *T5*	9.025 *R3,R2* 8.775 *T5*		5.30 *E2*				
	Chicago, Joliet, Waukegan, Madison, Harvey, Ill.	5.675 *U1,R3, W8,N4,P13*	5.675 *U1,R3, N4,P13,W8* 5.875 *L1*	7.65 *A5, W10,W8, B5,L2,N9*	6.725 *U1,R3, W8*	9.025 *A5, W10,W8, L2,N8,B5*	8.30 *U1,W8, R3*	5.30 *U1,A1, W8,I3*	6.375 *U1*	7.50 *U1, W8*	7.95 *U1, W8*	8.00 *A5,R3, W8,N4, K2,W7*
	Cleveland, Elyria, Ohio	5.675 *R3*	5.675 *R3*	7.65 *A5,C13, C18*		9.025 *A5, C13,C18*	8.30 *R3*	5.30 *R3,J3*	6.375 *J3*		7.95 *R3,J3*	8.00 *A5, C13,C18*
	Detroit, Mich.	5.675 *G3*	5.675 *G3*	7.90 *P3* 7.85 *P8,B5* 7.65 *R5*	6.725 *R5,G3*	9.025 *R5* 9.225 *B5,P3, P8*	8.30 *G3*	5.30 *G3*		7.50 *G3*	7.95 *G3*	
	Duluth, Minn.											8.00 *A5*
	Gary, Ind. Harbor, Crawfordsville, Hammond, Ind.	5.675 *U1,I3, Y1*	5.675 *U1,I3, Y1*	7.65 *R3,J3*	6.725 *U1,I3, Y1*	9.025 *R3,M4*	8.30 *U1,Y1*	5.30 *U1,I3, Y1*	6.375 *J3, I1*	7.50 *U1, Y1*	7.95 *U1, Y1,I3*	8.10 *M4*
	Granite City, Ill.							5.40 *G2*				
	Kokomo, Ind.		5.775 *C9*									8.10 *C9*
	Sterling, Ill.	5.775 *N4*	5.775 *N4*					5.30 *N4*				8.10 *K2*
	Niles, Warren, Ohio Sharon, Pa.			7.65 *C10*	6.725 *C10,*	9.025 *C10*		5.30 *R3,S1*		7.50 *S1*	7.95 *R3, S1*	
	Owensboro, Ky.	5.675 *G5*			6.725 *G5*							
	Pittsburgh, Midland, Donora, Aliquippa, Pa.	5.675 *U1,J3*	5.675 *U1,J3*	7.65 *A5,B4, R3,J3,C11, W10,S9,C8, M9*	6.725 *U1,J3, C11,B7*	9.025 *A5, W10,R3,S9, C11,C8,M9*	8.30 *U1,J3*	5.30 *U1,J3*	6.375 *U1,J3*	7.50 *U1, J3,B7*	7.95 *U1, J3,B7*	8.00 *A5, J3,P6*
	Portsmouth, Ohio											8.00 *P7*
	Weirton, Wheeling, Follansbee, W. Va.							5.30 *W5*				
	Youngstown, Ohio	5.675 *U1,R3, Y1*	5.675 *U1,R3, Y1*	7.65 *A1,Y1, F2*	6.725 *U1,Y1*	9.025 *Y1,F2*	8.30 *U1,Y1*	5.30 *U1, R3,Y1*		7.50 *Y1*	7.95 *U1,Y1*	8.00 *Y1*
WEST	Emeryville, Fontana, Cal.	6.425 *J5* 6.375 *K1*	6.425 *J5* 6.375 *K1*		7.775 *K1*		9.00 *K1*	6.10 *K1*		8.30 *K1*	8.75 *K1*	
	Geneva, Utah							5.30 *C7*			7.95 *C7*	
	Kansas City, Mo.	5.925 *S2*	5.925 *S2*		6.975 *S2*		8.55 *S2*					8.25 *S2*
	Los Angeles, Torrance, Cal.	6.375 *C7,B2*	6.375 *C7,B2*	9.10 *R3,P14, S12*	7.775 *B2*	11.00 *P14, S12*	9.00 *B2*					8.95 *B2*
	Minnequa, Colo.	6.125 *C6*	6.125 *C6*					6.15 *C6*				8.25 *C6*
	Portland, Ore.	6.425 *O2*	6.425 *O2*									
	San Francisco, Niles, Pittsburg, Cal.	6.375 *C7* 6.425 *B2*	6.375 *C7* 6.425 *B2*				9.05 *B2*					8.95 *C7,C6*
	Seattle, Wash.	6.425 *B2,N6, A10*	6.425 *B2,A10*				9.05 *B2*	6.20 *B2*		8.40 *B2*	8.85 *B2*	
SOUTH	Atlanta, Ga.	5.875 *A8*	5.675 *A8*									8.00 *A8*
	Fairfield City, Ala. Birmingham, Ala.	5.675 *T2,R3, C16*	5.675 *T2,R3, C16*	8.25 *C16*			8.30 *T2*	5.30 *T2,R3*			7.95 *T2*	8.00 *T2,R3*
	Houston, Ft. Worth, Lone Star, Texas	5.925 *S2*	5.925 *S2*		6.975 *S2*		8.55 *S2*	5.40 *S2*		7.60 *S2*	8.05 *S2*	8.25 *S2*

† Merchant Quality—Special Quality 35¢ higher. (Effective Jan. 18, 1960) * Special Quality.

STEEL PRICES

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angel Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, Ohio
A8 Atlantic Steel Co., Atlanta, Ga.
A9 Acme-Newport Steel Co., Newport, Ky.
A10 Alaska Steel Mills, Inc., Seattle, Wash.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Steel Co., Pacific Coast Div.
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.
B6 Brook Plant, Wickwire Spencer Steel Div., Birdsboro, Pa.
B7 A. M. Byers, Pittsburgh
B8 Braeburn Alloy Steel Corp., Braeburn, Pa.

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C4 Claymont Products Dept., Claymont, Del.
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, Pittsburgh
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shafting Co., Readville, Mass.
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Steel Div., Birmingham
C18 Cold Drawn Steel Plant, Western Automatic Machine Screw Co., Elyria, O.

D1 Detroit Steel Corp., Detroit
D2 Driver, Wilbur B. Co., Newark, N. J.
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire-Reeves Steel Corp., Mansfield, O.
E3 Enamel Products & Plating Co., McKeesport, Pa.

F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.
G5 Green River Steel Corp., Owenboro, Ky.

H1 Hanna Furnace Corp., Detroit

I2 Ingersoll Steel Div., New Castle, Ind.
I3 Inland Steel Co., Chicago, Ill.
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Calif.
K2 Keystone Steel & Wire Co., Peoria
K4 Keystone Drawn Steel Co., Spring City, Pa.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid States Steel & Wire Co., Crawfordsville, Ind.
M6 Mystic Iron Works, Everett, Mass.
M7 Milton Steel Products Div., Milton, Pa.
M8 Mill Strip Products Co., Chicago, Ill.
M9 Moltrup Steel Products Co., Beaver Falls, Pa.

N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.
N8 Carpenter Steel of New England, Inc., Bridgeport, Conn.
N9 Nelson Steel & Wire Co.

O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Steel Corp., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.
P11 Production Steel Strip Corp., Detroit
P13 Phoenix Mfg. Co., Joliet, Ill.
P14 Pacific Tube Co.
P15 Philadelphia Steel and Wire Corp.

R1 Reeves Steel & Mfg. Div., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co., John A., Trenton, N. J.
R5 Jones & Laughlin Steel Corp., Stainless and Strip Div.
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.

S1 Sharon Steel Corp., Sharon Pa.
S2 Sheffield Steel Div., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw and Steel Co., Fitchburg, Mass.
S5 Sweet's Steel Co., Williamsport, Pa.
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Div. of Copperweld Steel Co., Carnegie, Pa.
S10 Seneca Steel Service, Buffalo
S11 Southern Electric Steel Co., Birmingham
S12 Sierra Drawn Steel Corp., Los Angeles, Calif.
S13 Seymour Mfg. Co., Seymour, Conn.
S14 Screw and Bolt Corp. of America, Pittsburgh, Pa.

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T7 Texas Steel Co., Fort Worth
T8 Thompson Wire Co., Boston

U1 United States Steel Corp., Pittsburgh
U2 Universal Cyclops Steel Corp., Bridgeville, Pa.
U3 Ulbrich Stainless Steels, Wallingford, Conn.
U4 U. S. Pipe & Foundry Co., Birmingham

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago.
W8 Wisconsin Steel Div., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh
W12 Wallace Barnes Steel Div., Bristol, Conn.
Y1 Youngstown Sheet & Tube Co., Youngstown, O.

PIPE AND TUBING — **Base discounts (net) f.o.b. mills. Base price about $200 per net ton.**

	BUTTWELD														SEAMLESS							
	½ In.		¾ In.		1 In.		1¼ In.		1½ In.		2 In.		2½-3 In.		2 In.		2½ In.		3 In.		3½-4 In.	
STANDARD T. & C.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
Sparrows Pt. *B3*	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50								
Youngstown *R3*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50								
Fontana *K1*	*10.75	*26.00	*7.75	*22.00	*4.25	*17.50	*1.75	*16.75	*1.25	*15.75	*0.75	*15.50	0.75	*15.50								
Pittsburgh *J3*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
Alton, Ill. *L1*	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50								
Sharon *M3*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50								
Fairless *N2*	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50								
Pittsburgh *N1*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
Wheeling *W5*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50								
Wheatland *W4*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50								
Youngstown *Y1*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
Indiana Harbor *Y1*	1.25	*14.0	4.25	*10.0	7.75	*5.50	10.25	*4.75	10.75	*3.75	11.25	*3.25	12.75	*3.50								
Lorain *N2*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. *B3*	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50								
Youngstown *R3*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Fairless *N2*	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50								
Fontana *K1*	*6.25		*2.25		0.75		1.25		1.75		2.25		2.75									
Pittsburgh *J3*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50
Alton, Ill. *L1*	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50								
Sharon *M3*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Pittsburgh *N1*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50
Wheeling *W5*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Wheatland *W4*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Youngstown *Y1*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50
Indiana Harbor *Y1*	5.75	*8.0	9.75	*4.0	12.75	0.50	13.25	*0.75	13.75	0.25	14.25	0.75	14.75	*0.50								
Lorain *N2*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50

Threads only, buttweld and seamless, 2¼ pt. higher discount. Plain ends, buttweld and seamless, 3-in. and under, 5½ pt. higher discount.
Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1¼, 1½ and 2-in., 1½ pt.; 2½ and 3-in., 1 pt., e.g., zinc price range of over 13¢ to 15¢ would lower discounts on 2½ and 3-in. pipe by 2 points; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 13.00¢ per lb.

(Effective Jan. 18, 1960)

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	per lb	SAE
18	4	1	—	—	$1.84	T-1
18	4	1	—	5	2.545	T-4
18	4	2	—	—	2.005	T-2
1.5	4	1.5	8	—	1.20	M-1
6	4	3	6	—	1.59	M-3
6	4	2	5	—	1.345	M-2
High-carbon chromium					.955	D-3, D-5
Oil hardened manganese					.505	O-2
Special carbon					.38	W-1
Extra carbon					.38	W-1
Regular carbon					.325	W-1

Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

CLAD STEEL

Base prices, cents per lb f.o.b.

	Cladding	Plate (*L4, C4, A3, J2*) 10 pct	Plate (*L4, C4, A3, J2*) 15 pct	Plate (*L4, C4, A3, J2*) 20 pct	Sheet (*I2*) 20 pct
Stainless Type	302	.....	.....	.....	37.50
	304	28.80	31.55	34.30	40.00
	316	42.20	46.25	50.25	58.75
	321	34.50	37.75	41.05	47.25
	347	40.80	44.65	48.55	57.00
	405	24.60	26.90	29.25	.....
	410	22.70	24.85	27.00	.....
	430	23.45	25.65	27.90	.....

CR Strip (S9) Copper, 10 pct, 2 sides, 44.20; 1 side, 36.80.

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Tie Plates	Track Bolts Untreated
Bessemer *U1*	5.75	6.725	7.25	.....	.....	.....
Cleveland *R3*	.....	.....	.....	.....	.....	15.35
So. Chicago *R3*	.....	.....	.....	10.10	.....	.....
Ensley *T2*	5.75	6.725	.....	.....	.....	.....
Fairfield *T2*	.....	6.725	.....	10.10	6.875	.....
Gary *U1*	5.75	.....	.....	.....	6.875	.....
Huntington, *C16*	.....	6.725	.....	.....	.....	.....
Ind. Harbor *I3*	.....	.....	.....	10.10	.....	.....
Johnstown *B3*	.....	6.725	.....	.....	.....	.....
Joliet *U1*	.....	.....	7.25	.....	.....	.....
Kansas City *S2*	.....	.....	.....	10.10	.....	15.35
Lackawanna *B3*	5.75	6.725	7.25	.....	6.875	.....
Lebanon *B3*	.....	.....	7.25	.....	.....	15.35
Minnequa *C6*	5.75	7.225	7.25	10.10	6.875	15.35
Pittsburgh *S14*	.....	.....	.....	.....	.....	15.35
Pittsburgh *J3*	.....	.....	.....	10.10	.....	.....
Seattle *B2*	.....	.....	.....	.....	6.75	15.85
Steelton *B3*	5.75	.....	7.25	.....	6.875	.....
Struthers *Y1*	.....	.....	.....	10.10	.....	.....
Torrance *C7*	.....	.....	.....	.....	6.75	.....
Williamsport *S5*	.....	6.725	.....	.....	.....	.....
Youngstown *R3*	.....	.....	.....	10.10	.....	.....

COKE

	Net-Ton
Furnace, beehive (f.o.b.) Connellsville, Pa.	$14.75 to $15.50
Foundry, beehive (f.o.b.)	$18.50
Foundry oven coke	
Buffalo, del'd	$33.25
Ironton, O., f.o.b.	30.50
Detroit f.o.b.	32.00
New England, del'd	33.55
New Haven, f.o.b.	31.00
Kearney, N. J., f.o.b.	31.25
Philadelphia, f.o.b.	31.00
Swedeland, Pa., f.o.b.	31.00
Painesville, Ohio, f.o.b.	32.00
Erie, Pa., f.o.b.	32.00
St. Paul, f.o.b.	31.25
St. Louis, f.o.b.	33.00
Birmingham, f.o.b.	30.35
Milwaukee, f.o.b.	32.00
Neville Is., Pa.	30.75

LAKE SUPERIOR ORES

51.50% Fe natural, delivered lower Lake ports. Interim prices for 1959 season. Freight changes for seller's account.

	Gross Ton
Openhearth lump	$12.70
Old range, bessemer	11.85
Old range, nonbessemer	11.70
Mesabi, bessemer	11.60
Mesabi, nonbessemer	11.45
High phosphorus	11.45

ELECTRICAL SHEETS

22-Gage F.o.b. Mill Cents Per Lb	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length) Semi-Processed	Cold-Reduced (Coiled or Cut Length) Fully Processed
Field	.....	9.875	.....
Armature	11.70	11.20	11.70
Elect.	12.40	11.90	12.40
Special Motor	.....	12.475	.....
Motor	13.55	13.05	13.55
Dynamo	14.65	14.15	14.65
Trans. 72	15.70	15.20	15.70
Trans. 65	16.30	Grain Oriented	
Trans. 58	16.80	Trans. 80	19.70
Trans. 52	17.85	Trans. 73	20.20
		Trans. 66	20.70

Producing points: Aliquippa (*J3*); Beech Bottom (*W5*); Brackenridge (*A3*); Granite City (*G2*); Indiana Harbor (*I3*); Mansfield (*E2*); Newport, Ky. (*A9*); Niles, O. (*S1*); Vandergrift (*U1*); Warren, O. (*R3*); Zanesville, Butler (*A7*).

ELECTRODES

Cents per lb. f.o.b. plant, threaded, with nipples, unboxed.

GRAPHITE Diam. (In.)	GRAPHITE Length (In.)	GRAPHITE Price	CARBON* Diam. (In.)	CARBON* Length (In.)	CARBON* Price
24	84	27.25	40	100,110	12.50
20	72	26.50	35	110	11.20
18	72	27.50	30	110	11.70
14	72	27.25	24	72	11.95
12	72	28.25	20	90	11.55
10	60	29.50	17	72	12.10
10	48	30.00	14	72	12.55
7	60	29.75	10	60	13.80
6	60	33.25	8	60	14.25
4	40	37.00			
3	40	39.25			
2½	30	41.50			
2	24	64.00			

* Prices shown cover carbon nipples.

REFRACTORIES

Fire Clay Brick

	Carloads per 1000
Super duty, Mo., Pa., Md., Ky.	$185.00
High duty (except Salina, Pa., add $5.00)	140.00
Medium duty	125.00
Low duty (except Salina, Pa., add $2.00)	103.00
Ground fire clay, net ton, bulk	22.50

Silica Brick

Mt. Union, Pa., Ensley, Ala.	$158.00
Childs, Hays, Latrobe, Pa.	163.00
Chicago District	168.00
Western Utah	183.00
California	165.00
Super Duty Hays, Pa., Athens, Tex., Windham, Warren, O., Morrisville	163.00-168.00
Silica cement, net ton, bulk, Latrobe	29.75
Silica cement, net ton, bulk, Chicago	26.75
Silica cement, net ton, bulk, Ensley, Ala.	27.75
Silica cement, net ton, bulk, Mt. Union	25.75
Silica cement, net ton, bulk, Utah and Calif.	39.00

Chrome Brick

Per net ton

Standard chemically bonded, Balt.	$109.00
Standard chemically bonded, Curtiner, Calif.	119.00
Burned, Balt.	103.00

Magnesite Brick

Standard, Baltimore	$140.00
Chemically bonded, Baltimore	119.00

Grain Magnesite

St. ⅝ to ½-in. grains

Domestic, f.o.b. Baltimore in bulk.	$73.00
Domestic, f.o.b. Chewalah, Wash., Luning, Nev. in bulk	46.00
in sacks	52.00-54.00

Dead Burned Dolomite

Per net ton

F.o.b. bulk, producing points in: Pa., W. Va., Ohio	$16.75
Missouri Valley	15.60
Midwest	17.00

(Effective Jan. 18, 1960)

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard Q Coated Nails Col	Woven Wire Fence Col	"T" Fence Posts Col	Single Loop Bale Ties Col	Galv. Barbed and Twisted Barbless Wire Col	Merch. Wire Ann'ld ¢/lb.	Merch. Wire Galv. ¢/lb.
Alabama City *R3*	173	187	....	212	193	9.00	9.55
Aliquippa *J3***	173	190	....	....	190	9.00	9.675
Atlanta *A8***	175	192	....	214	198	8.75	9.425
Bartonville *K2***.	175	192	178	214	198	9.10	9.775
Buffalo *W6*	.....	.....	.....	.....	.....	9.00	9.55*
Chicago *N4***...	173	190	177	212	196	9.00	9.70
Chicago *R3*	.....	.....	.....	.....	.....	9.00	9.55
Cleveland *A6*	.....	.....	.....	.....	.....	.....	.....
Cleveland *A5*	.....	.....	.....	.....	.....	9.00	.....
Crawf'dav. *M4***	175	192	....	214	198	9.10	9.775
Donora, Pa. *A5*..	173	187	....	212	193	9.00	9.55
Duluth *A5*.....	173	187	....	212	193	9.00	9.55
Fairfield, Ala. *T2*	173	187	....	212	193	9.00	9.55
Galveston *D4*...	9.10‡	.....	.....	.....	.....	.....	.....
Houston *S2*.....	178	192	....	217	198	9.25	9.80†
Jacksonville *M4*.	184-‡	197	....	219	203	9.10	9.775
Johnstown *B3***.	173	190	177	....	196	9.00	9.675
Joliet, Ill. *A5*....	173	187	....	212	193	9.00	9.55
Kokomo *C9*.....	175	189	....	214	195*	9.10	9.65*
L. Angeles *B2***.	.....	.....	.....	.....	.....	9.95	10.625
Kansas City *S2**	178	192	....	217	198*	9.25	9.80†
Minnequa *C6*...	178	192	182	217	198†	9.25	9.80†
Monessen *P6*....	.....	.....	.....	.....	193	8.65	9.325
Palmer, Mass. *W6*	.....	.....	.....	.....	.....	9.30	9.85*
Pittsburg, Cal. *C7*	192	210	.....	.....	213	9.60	10.15
Rankin, Pa. *A5*..	173	187	.....	.....	193	9.00	9.55
So. Chicago *R3*..	173	187	.....	.....	193	8.65	9.20
S. San Fran. *C6*.	.....	.....	.....	236	.....	9.95	10.50†
SparrowsPt. *B3***.	175	.....	.....	214	198	9.10	9.775
Struthers, O. *Y1**	.....	.....	.....	.....	.....	8.65	9.20
Worcester *A5*...	179	.....	.....	.....	.....	9.30	9.85
Williamsport *S5*.	.....	.....	.....	.....	.....	.....	.....

* Zinc less than .10¢. *** .10¢ zinc.
** 11-12¢ zinc. † Plus zinc extras.
‡ Wholesalers only.

C-R SPRING STEEL

Cents Per Lb F.o.b. Mill	CARBON CONTENT 0.26-0.40	0.41-0.60	0.61-0.80	0.81-1.05	1.06-1.35
Anderson, Ind. *G4*	8.95	10.40	12.60	15.60	18.55
Baltimore, Md. *T8*	9.50	10.70	12.90	15.90	18.85
Bristol, Conn. *W12*	.....	10.70	12.90	16.10	19.30
Boston *T8*	9.50	10.70	12.90	15.90	18.85
Buffalo, N. Y. *R7*	8.95	10.40	12.60	15.60	18.55
Carnegie, Pa. *S9*	8.95	10.40	12.60	15.60	18.55
Chicago	.....	.....	.....	15.60	.....
Cleveland *A5*	8.95	10.40	12.60	15.60	18.55
Dearborn *S1*	9.05	10.50	12.70	.....	.....
Detroit *D1*	9.05	10.50	12.70	15.70	.....
Detroit *D2*	9.05	10.50	12.70	.....	.....
Dover, O. *G4*	8.95	10.40	12.60	15.60	18.55
Evanston, Ill. *M8*	9.05	10.40	12.60	.....	.....
Franklin Park, Ill. *T8*	9.05	10.40	12.60	15.60	18.55
Harrison, N. J. *C11*	.....	.....	12.90	16.10	19.30
Indianapolis *R5*	9.10	10.55	12.60	15.60	18.55
Los Angeles *C1*	11.15	12.60	14.80	17.80	.....
New Britain, Conn. *S7*	9.40	10.70	12.90	15.90	18.85
New Castle, Pa. *B4*	8.95	10.40	12.60	15.60	.....
New Haven, Conn. *D1*	9.40	10.70	12.90	15.90	.....
Pawtucket, R. I. *N7*	9.50	10.70	12.90	15.90	18.85
Riverdale, Ill. *A1*	9.05	10.40	12.60	15.60	18.55
Sharon, Pa. *S1*	8.95	10.40	12.60	15.60	18.55
Trenton, *R4*	.....	10.70	12.90	16.10	19.30
Wallingford *W1*	9.40	10.70	12.90	15.90	18.55
Warren, Ohio *T4*	8.95	10.40	12.60	15.60	18.75
Worcester, Mass. *A5*	9.50	10.70	12.90	15.90	18.85
Youngstown *R5*	9.10	10.55	12.60	15.60	18.55

BOILER TUBES

$ per 100 ft. carload lots cut 10 to 24 ft. F.o.b. Mill	Size OD-In.	Size B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
Babcock & Wilcox	2	13	40.28	47.21	35.74
	2½	12	54.23	63.57	48.13
	3	12	62.62	73.40	55.50
	3½	11	73.11	85.70	65.84
	4	10	97.08	113.80	88.10
National Tube	2	13	40.28	47.21	35.74
	2½	12	54.23	63.57	48.13
	3	12	62.62	73.40	55.50
	3½	11	73.11	85.70	65.84
	4	10	97.08	113.80	88.10
Pittsburgh Steel	2	13	40.28	47.21	.....
	2½	12	54.23	63.57	.....
	3	12	62.62	73.40	.....
	3½	11	73.11	85.70	.....
	4	10	97.08	113.80	.....

METAL POWDERS

Cents per lb, minimum truckload, delivered E. of Miss. River, unless otherwise noted.

Iron Powders

Compacting Powders

Electrolytic, imported, f.o.b.	29.50 to 33.00
Electrolytic, domestic	34.50
Sponge	11.50
Atomized	11.25
Hydrogen Reduced	11.25 to 12.00
Carbonyl	88.00
Welding Powders*	8.10
Cutting and Scarfing Powders*	9.10

Copper Powders

Electrolytic, domestic	48.25
Precipitated	40.50 to 45.00
Atomized	39.80 to 48.30
Hydrogen reduced, f.o.b.	43.25
Bronze	47.20 to 51.50
Chromium, electrolytic	$5.00
Lead	19.00
Manganese, f.o.b.	42.00
Molybdenum	$3.60 to $3.95
Nickel	$1.05 to $1.03
Nickel Silver	53.50
Nickel Steel	13.00
Solder	13¢ plus metal value
Stainless Steel, 302	$1.07
Stainless Steel, 316	$1.26
Steel, atomized, prealloyed, 4600 series	14.00 plus metal value
Tin	14¢ plus metal value
Titanium, 99.25+%, per lb., f.o.b.	$11.25
Tungsten	$3.15 (nominal)

* F.O.B., shipping point.

BOLTS, NUTS, RIVETS, SCREWS

(Base discount, f.o.b. mill)

Pct. Discounts

Bolts	1-4 Containers	5 Containers	20,000 Lb.	40,000 Lb.
Machine				
½" and smaller x 3" and shorter	55	57	61	62
⅝" diam. x 3" and shorter	47	49½	54	55
¾" thru 1" diam x 6" and shorter	37	39½	45	46
¾" thru 1" diam. longer than 6" and 1½" and larger x all lengths	31	34	40	41
Rolled thread, ½" and smaller x 3" and shorter	55	57	61	62
Carriage, lag, plow, tap, blank, step, elevator and fitting up bolts ½" and smaller x 6" and shorter	48	50½	55	56

Note: Add 25 pct for less than container quantity. Distributor prices are 5 pct less on bolts and square nuts.

Nuts, Hex, HP reg. & hvy.	Full case or Keg price
¾ in. or smaller	62
⅞ in. to 1½ in. inclusive	56
1⅝ in. and larger	51½

C. P. Hex, reg. & hvy.

¾ in. or smaller	62
⅞ in. to 1½ in. inclusive	56
1⅝ in. and larger	51½

Hot Galv. Hex Nuts (All Types)

¾ in. and smaller	41

Semi-finished Hex Nuts

¾ in. or smaller	62
⅞ in. to 1½ in. inclusive	56
1⅝ in. and larger	51½

(Add 25 pct for broken case or keg quantities)

Finished

⅞ in. and smaller	65

Rivets

Base per 100 lb

½ in. and larger	$12.85

Pct. Off List

7/16 in. and smaller	15

Cap Screws

Discount (Packages)

Full Finished H. C. Heat Treat

New std. hex head, packaged	Full Case
⅝" diam. and smaller x 6" and shorter	54 / 42
¾", ⅞", and 1" diam. x 6" and shorter	38 / 23
⅝" diam. and smaller x longer than 6"	.. / ..
¾", ⅞", and 1" diam. x longer than 6"	.. / ..

	C-1018 Steel Full-Finished Cartons	Bulk
¼" through ⅝" dia. x 6" and shorter	59	48
¾" through 1" dia. x 6" and shorter	45	32

Minimum quantity—¼" through ⅜" diam., 15,000 pieces; 7/16" through ⅝" diam., 5,000 pieces; ¾" through 1" diam., 2,000 pieces.

Machine Screws & Stove Bolts

Plain Finish	Discount Mach. Screws	Discount Stove Bolts
Cartons	60	60
Bulk		
Quantity		
To ¼" diam. incl. — 25,000-and over	60	..
5/16 to ½" diam. incl. — 15,000-200,000	60	..

Machine Screws & Stove Bolt Nuts

	Discount Hex	Discount Square
In Cartons	16	19
Quantity		
In Bulk		
⅜" diam. & smaller — 25,000-and over	15	16

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, frt allowed in quantity)

Copper	
Rolled elliptical, 18 in. or longer, 5000 lb lots	48.00
Electrodeposited	40.00
Brass, 80-20, ball anodes, 2000 lb or more	53.00
Zinc, ball anodes, 2000 lb lots (for elliptical add 1¢ per lb)	19.75
Nickel, 99 pct plus, rolled carton, 5000 lb	1.0225
(Rolled depolarized add 3¢ per lb)	
Cadmium, 5000 lb	1.30
Tin, ball anodes $1.05 per lb (approx.).	

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	65.90
Copper sulphate, 100 lb bags, per cwt.	27.75
Nickel salts, single, 100 lb bags	36.00
Nickel chloride, freight allowed, 100 lb	45.00
Sodium cyanide, domestic, f.o.b. N. Y., 200 lb drums	23.70
(Philadelphia price 25.00)	
Zinc cyanide, 100 lb	60.75
Potassium cyanide, 100 lb drum N. Y.	45.50
Chromic acid, flake type, 10,000 lb or more	30.44

CAST IRON WATER PIPE INDEX

Birmingham	125.8
New York	138.5
Chicago	140.9
San Francisco-L. A.	148.6

Dec. 1955, value, Class B or heavier 5 in. or larger, bell and spigot pipe. Explanation: p. 57, Sept. 1, 1955, issue. Source: U. S. Pipe and Foundry Co.

STEEL SERVICE CENTERS

Metropolitan Price, dollars per 100 lb.

Cities	City Delivery‡ Charge	Sheets: Hot-Rolled (10 ga. & hvr.)	Sheets: Cold-Rolled (15 gage)	Sheets: Galvanized (10 gage)††	Strip: Hot-Rolled	Plates	Shapes: Standard Structural	Bars: Hot-Rolled (merchant)	Bars: Cold-Finished	Alloy Bars: Hot-Rolled 4615 As rolled	Alloy Bars: Hot-Rolled 4140 Annealed	Alloy Bars: Cold-Drawn 4615 As rolled	Alloy Bars: Cold-Drawn 4140 Annealed
Atlanta		8.59	9.87	10.13	8.91	9.29	9.40	9.39	13.24	.....	.....	.....	.....
Baltimore**	$.10	9.90	10.10	10.16	11.55	10.00	10.65	10.15	11.90	17.48	16.48	21.58	20.83
Birmingham**		9.43	10.20	10.46	10.91	9.79	10.00	9.59	13.14	16.76	.....	.....	.....
Boston**	.10	10.52	11.27	11.87	12.17	10.42	10.72	10.34	13.45	17.69	16.69	21.79	21.04
Buffalo**	.15	9.80	10.50	11.40	11.30	10.25	10.40	9.90	11.60	17.45	16.45	21.55	20.80
Chicago**	.15	8.69	10.35	11.10	10.35	8.62	9.16	8.79	10.80	17.10	16.10	19.70	20.45
Cincinnati**	.15	8.86	10.41	11.10	10.67	9.00	9.84	9.11	11.68	17.42	16.42	21.52	20.77
Cleveland**	.15	8.69[1]	9.89	11.09	10.47	8.88	9.67	8.90	11.40	17.21	16.21	21.31	20.56
Denver	.20	9.60	11.84	12.94	9.63	9.96	10.04	10.00	11.19	.....	.....	.....	20.84
Detroit**	.15	8.95	10.61	11.40	10.72	8.99	9.84	9.10	11.16	17.38	16.38	21.48	21.03
Houston**		9.65	9.65	.....	10.85	9.65	9.35	8.90	13.10	17.50	16.55	21.55	20.85
Kansas City	.15	9.02	10.27	11.37	9.33	9.71	9.82	9.81	10.22	16.87	15.87	20.37	19.62
Los Angeles**		9.95[1]	11.55	12.20	11.55	10.00	10.00	9.10	14.20	18.30	16.45	21.30	20.80
Memphis	.15	8.55	9.80	.....	8.60	8.93	9.01	8.97	12.11	.....	.....	.....	.....
Milwaukee**	.15	8.83	10.49	11.24	10.49	8.76	9.30	8.93	11.04	17.24	15.34	21.24	19.09
New York	.10	9.27	10.59	11.45	9.74	9.87	9.84	10.09	13.35	16.16	15.60	20.10	19.35
Norfolk	.20	8.20	.....	.....	8.90	8.65	9.20	8.90	10.70	.....	.....	.....	.....
Philadelphia	.10	8.30	9.35	10.99	9.35	9.25	9.20	9.50	12.05	16.58	15.58	20.08	19.33
Pittsburgh**	.15	8.69	9.84	10.91	10.45	8.62	9.78	8.79	11.40	17.10	16.10	19.70	20.45
Portland		10.00	11.75	13.30	11.95	11.50	11.10	9.85	15.30	18.50	17.45	20.75	20.25
San Francisco**	.10	11.00	11.95[2]	11.50	12.25	11.00	10.95	10.75	15.20	18.30	16.35	22.90	20.60
Seattle**		11.55	12.30	12.50	12.65	11.00	10.20	11.10	16.20	18.60	17.80	22.70	22.20
Spokane**	.15	11.70	12.45	12.65	13.30	11.15	11.35	11.75	16.35	17.75	17.95	21.58	22.35
St. Louis**	.15	9.07	10.73	11.48	10.73	9.00	9.76	9.17	11.43	17.48	16.48	21.58	19.33
St. Paul**	.15	8.95	9.46	10.69	10.47	8.75	9.48	8.85	11.64	.....	16.69	.....	21.04

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 4999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may be combined with each other for quantity. ** These cities are on net pricing. Prices shown are for 2000 lb item quantities of the following: Hot-rolled sheet—10 ga. x 36 x 96—120; Cold-rolled sheet—20 ga x 36 x 96—120; Galv. sheet—10 ga x 36—120; Hot-rolled strip—⅛" x 1"; Plate—¼" x 84"; Shapes—I-Beams 6 x 12.5; Hot-rolled bar—Rounds—¾-2 15/16; Cold-finished bar—C 1018—1" rounds; Alloy bar—hot-rolled 4615—1⅝" to 2⅞"; cold drawn—15/16" to 2⅞" round; Hot-rolled 4140—⅞" to 2⅞" round, cold drawn—15/16" to 2⅞" round.

†† 10¢ zinc. ‡ Deduct for country delivery. [1] 15 ga. & heavier; [2] 14 ga. & lighter.

(Effective Jan. 18, 1960)

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Birdsboro, Pa. *B6*	68.00	68.50	69.00	69.50	.....
Birmingham *R3*	62.00	62.50*	.....	.....	.....
Birmingham *W9*	62.00	62.50*	66.50	.....	.....
Birmingham *U4*	62.00	62.50*	66.50	.....	.....
Buffalo *R3*	66.00	66.50	67.00	67.50	.....
Buffalo *H1*	66.00	66.50	67.00	67.50	.....
Buffalo *W6*	66.00	66.50	67.00	67.50	.....
Chester *P2*	68.00	68.50	69.00	.....	.....
Chicago *I4*	66.00	66.50	66.50	67.00	.....
Cleveland *A5*	66.00	66.50	66.50	67.00	71.00†
Cleveland *R3*	66.00	66.50	66.50	67.00	.....
Duluth *I4*	66.00	66.50	66.50	67.00	71.00†
Erie *I4*	66.00	66.50	66.50	67.00	71.00†
Everett *M6*	67.50	68.00	68.50	.....	.....
Fontana *K1*	75.00	75.50	.....	.....	.....
Geneva, Utah *C7*	66.00	66.50	.....	.....	.....
Granite City *G2*	67.90	68.40	68.90	.....	.....
Hubbard *Y1*	.....	.....	66.50	.....	.....
Ironton, Utah *C7*	66.00	66.50	.....	.....	.....
Midland *C11*	66.00	.....	.....	.....	.....
Minnequa *C6*	68.00	68.50	69.00	.....	.....
Monessen *P6*	66.00	.....	.....	.....	.....
Neville Is. *P4*	66.00	66.50	66.50	67.00	71.00†
N. Tonawanda *T1*	.....	66.50	67.00	67.50	.....
Sharpsville *S3*	66.00	.....	66.50	67.00	.....
So. Chicago *R3*	66.00	66.50	66.50	67.00	.....
So. Chicago *W8*	66.00	.....	66.50	67.00	.....
Swedeland *A2*	68.00	68.50	69.00	69.50	73.00†
Toledo *I4*	66.00	66.50	66.50	67.00	.....
Troy, N. Y. *R3*	68.00	68.50	69.00	69.50	73.00
Youngstown *Y1*	.....	.....	66.50	.....	.....

DIFFERENTIALS: Add, 75¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.25 pct manganese or portion thereof over 1 pct, $2 per ton for 0.50 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel. Add $1.00 for 0.31-0.69 pct phos.

Silvery Iron: Buffalo (6 pct), *H1*, $79.25; Jackson *J1*, *I4* (Globe Div.), $78.00; Niagara Falls (15.01-15.50), $101.00; Keokuk (14.01-14.50), $103.50; (15.51-16.00), $106.50. Add $1.00 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 18 pct. Add $1.25 for each 0.50 pct manganese over 1.00 pct. Bessemer silvery pig iron (under .10 pct phos.): $64.00. Add $1.00 premium for all grades silvery to 18 pct.

† Intermediate low phos.

STAINLESS STEEL

Base price cents per lb. f.o.b. mill

Product	201	202	301	302	303	304	316	321	347	403	410	416	430
Ingots, reroll.	22.75	24.75	24.00	26.25	—	28.00	41.25	33.50	38.50	—	17.50	—	17.75
Slabs, billets	28.00	31.50	29.00	32.75	33.25	34.50	51.25	41.50	48.25	—	22.25	—	22.50
Billets, forging	—	37.75	38.75	39.50	42.50	42.00	64.50	48.75	57.75	29.25	29.25	29.75	29.75
Bars, struct.	43.50	44.50	46.00	46.75	49.75	49.50	75.75	57.50	67.25	35.00	35.00	35.50	35.50
Plates	39.25	40.00	41.25	42.25	45.00	45.75	71.75	54.75	64.75	30.00	30.00	31.25-31.75	31.00
Sheets	48.50	49.25	51.25	52.00	56.75	55.00	80.75	65.50	79.25	40.25	40.25	48.25	40.75
Strip, hot-rolled	36.00	39.00	37.25	40.50	—	44.25	69.25	53.50	63.50	—	31.00	—	32.00
Strip, cold-rolled	45.00	49.25	47.50	52.00	56.75	55.00	80.75	65.50	79.25	40.25	40.25	42.50	40.75
Wire CF; Rod HR	—	42.25	43.50	44.25	47.25	47.00	71.75	54.50	63.75	33.25	33.25	33.75	33.75

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., *C11;* Brackenridge, Pa., *A3;* Butler, Pa., *A7;* Vandergrift, Pa., *U1;* Washington, Pa., *W2, J2;* Baltimore, *E1;* Middletown, O., *A7;* Massillon, O., *R3;* Gary, *U1;* Bridgeville, Pa., *U2;* New Castle, Ind., *I2;* Detroit, *M2;* Louisville, O., *R5.*

Strip: Midland, Pa., *C11;* Waukegan, Cleveland, *A5;* Carnegie, Pa., *S9;* McKeesport, Pa., *F1;* Reading, Pa., *C2;* Washington, Pa., *W2;* W. Leechburg, Pa., *A3;* Bridgeville Pa., *U2;* Detroit, *M2;* Detroit, *S1;* Canton, Massillon, O., *R3;* Harrison, N. J., *D3;* Youngstown, *R5;* Sharon, Pa., *S1;* Butler, Pa., *A7;* Wallingford, Conn., *U3* (plus further conversion extras); *W1* (25¢ per lb. higher); Seymour, Conn., *S13,* (25¢ per lb. higher); New Bedford, Mass., *R6* Gary, *U1,* (25¢ per lb. higher); Baltimore, Md., *E1* (300 series only).

Bar: Baltimore, *A7;* S. Duquesne, Pa., *U1;* Munhall, Pa., *U1;* Reading, Pa., *C2;* Titusville, Pa., *U2;* Washington, Pa., *J2;* McKeesport, Pa., *U1, F1;* Bridgeville, Pa., *U2;* Dunkirk, N. Y., *A3;* Massillon, O., *R5;* S. Chicago, *U1;* Syracuse, N. Y., *C11;* Watervliet, N. Y., *A3;* Waukegan, *A5;* Canton, O., *T5, R3;* Ft. Wayne, *I4;* Detroit, *R5;* Gary, *U1;* Owensboro, Ky., *G5;* Bridgeport, Conn., *N8;* Ambridge, Pa., *B7.*

Wire: Waukegan, *A5;* Massillon, O., *R3;* McKeesport, Pa., *F1;* Ft. Wayne, *J4;* Newark, N. J. *D2;* Harrison, N. J., *D3;* Baltimore, *A7;* Dunkirk, *A3;* Monessen, *P1;* Syracuse, *C11;* Bridgeville, *U2;* Detroit, *R5;* Reading, Pa., *C2;* Bridgeport, Conn., *N8.*

Structurals: Baltimore, *A7;* Massillon, O., *R3;* Chicago, Ill., *J4;* Watervliet, N. Y., *A3;* Syracuse, *C11;* S. Chicago, *U1.*

Plates: Ambridge, Pa., *B7;* Baltimore, *E1;* Brackenridge, Pa., *A3;* Chicago, *U1;* Munhall, Pa., *U1;* Midland, Pa., *C11;* New Castle, Ind., *I2;* Middletown, *A7;* Washington, Pa., *J2;* Cleveland, Massillon, *R3;* Coatesville, Pa., *C15;* Vandergrift, Pa., *U1;* Gary, *U1.*

Forging billets: Ambridge, Pa., *B7;* Midland, Pa., *C11;* Baltimore, *A7;* Washington, Pa., *J2;* McKeesport, *F1;* Massillon, Canton, O., *R3;* Watervliet, *A3;* Pittsburgh, Chicago, *U1;* Syracuse, *C11;* Detroit, *R5;* Munhall, Pa., S. Chicago, *U1;* Owensboro, Ky., *G5;* Bridgeport, Conn., *N8;* Reading, Pa., *C2.*

(Effective Jan. 18, 1960)

HOW LONG SINCE YOU CHECKED ON PERFORATIONS?

No matter what material your product demands Mundt can supply the exact perforation you need. Steel, brass, copper, monel, bronze, aluminum, zinc, tinplate, lead, stainless steel, coated metals, bonded materials, plastics, and paper are punched as required for every functional and ornamental need.

You can count on Mundt's guarantee that sheets are perfectly flat, straight, parallel on the sides, and free from buckle or camber.

Our modern tool and machine shop is constantly making new dies to add to the tremendous variety of screens available. If you have a special problem we'll gladly supply design and metallurgical assistance.

No job is too small for our careful, personal attention . . . or too large for prompt delivery. Mundt's 90 years' experience is at your disposal.

Write for Free Catalog

CHARLES MUNDT & SONS

53 FAIRMOUNT AVENUE, JERSEY CITY 4, N. J.

PERFORATING SPECIALISTS FOR ALL TYPES OF MATERIALS

MACHINE WORK & SPECIAL MACHINE BUILDING

We have large, medium and small machine tools available for machine work and the building of special machinery.

We will be pleased to receive your inquiries.

SUN SHIP

BUILDING & DRYDOCK COMPANY

CHESTER, PA.

Ferrochrome

Cents per lb contained Cr, lump, bulk, carloads, del'd. 67-71% Cr, .30-1.00% max. Si.

0.02% C....	41.00	0.50% C....	38.00
0.05% C....	39.00	1.00% C....	37.75
0.10% C....	38.50	1.50% C....	37.50
0.20% C....	38.25	2.00% C....	37.25

4.00-4.50% C, 60-70% Cr, 1-2% Si.. 37.25
3.50-5.00% C, 57-64% Cr, 2.00-4.50% Si 28.25
0.025% C (Simplex) 36.75
5-7% C, 61-65% Cr, 5-8% Si 22.00
5% max C, 50-55% Cr, 2% max Si.. 25.00

High Nitrogen Ferrochrome

Low-carbon type 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome max. 0.10% C price schedule.

Chromium Metal

Per lb chromium, contained, packed, delivered, ton lots, 97.25% min. Cr, 1% max. Fe.
0.10% max. C $1.29
9 to 11% C, 88-91% Cr, 0.75% Fe... 1.38

Electrolytic Chromium Metal

Per lb of metal 2" x D plate (⅛" thick) delivered packed, 99.80% min Cr. (Metallic Base) Fe 0.20 max.
Carloads $1.15
Ton lots 1.17
Less ton lots 1.19

Low Carbon Ferrochrome Silicon

(Cr 39-41%, Si 42-45%, C 0.05% max.) Carloads, delivered, lump, 3-in. x down, packed.
Price is sum of contained Cr and contained Si.

	Cr	Si
Carloads, bulk	28.25	14.60
Ton lots	33.50	16.05
Less ton lots	35.10	17.70

Calcium-Silicon

Per lb of alloy, lump, delivered, packed.
30-33% Ca, 60-65% Si, 3.00 max. Fe.
Carloads, bulk 24.00
Ton lots 27.95
Less ton lots 29.45

Calcium-Manganese—Silicon

Cents per lb of alloy, lump, delivered, packed.
16-20% Ca, 14-18% Mn, 53-59% Si.
Carloads, bulk 23.00
Ton lots 26.15
Less ton lots 27.15

SMZ

Cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe ½ in. x 12 mesh.
Ton lots 21.15
Less ton lots 22.40

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5; 38-42% Cr, 17-19% Si, 8-11% Mn, packed.
Carload lots 18.45
Ton lots 19.95
Less ton lots 21.20

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.
Carload bulk 19.20
Ton lots to carload packed 21.15
Less ton lots 22.40

Ferromanganese

Maximum base price, f.o.b., lump size, base content 74 to 76 pct Mn. Carload lots, bulk.

Producing Point	Cents per-lb
Marietta, Ashtabula, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore.	12.25
Johnstown, Pa.	12.25
Neville Island, Pa.	12.25
Sheridan, Pa.	12.25
Philo, Ohio	12.25
S. Duquesne	12.25

Add or substract 0.1¢ for each 1 pct Mn above or below base content.
Briquets, delivered, 66 pct Mn:
Carloads, bulk 14.80
Ton lots packed in bags 17.20

Spiegeleisen

Per gross ton, lump, f.o.b. Palmerton, Pa., and Neville Island, Pa.

Manganese	Silicon	
16 to 19%	3% max.	$100.50
19 to 21%	3% max.	102.50
21 to 23%	3% max.	105.00

Manganese Metal

2 in. x down, cents per pound of metal delivered.
95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.
Carload, packed 45.75
Ton lots 47.25

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.
Carloads 34.00
Ton lots 36.00
250 to 1999 lb 38.00
Premium for Hydrogen - removed metal 0.75

Medium Carbon Ferromanganese

Mn 80 to 85%, C 1.25 to 1.50, Si 1.50% max., carloads, lump, bulk, delivered, per lb of contained Mn 25.50

Low-Carb Ferromanganese

Cents per pound Mn contained, lump size, packed, del'd Mn 85-90%.

	Carloads	Ton	Less
0.07% max. C, 0.06% (Bulk) P, 90% Mn	37.15	39.95	41.15
0.07% max. C	35.10	37.90	39.10
0.10% max. C	34.35	37.15	38.35
0.15% max. C	33.60	36.40	37.60
0.30% max. C	32.10	34.90	36.10
0.50% max. C	31.60	34.40	35.60
0.75% max. C, 80.85% Mn, 5.0-7.0% Si ...	28.60	31.40	32.60

Silicomanganese

Lump size, cents per pound of metal, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢ f.o.b. shipping point.
Carloads bulk 12.80
Ton lots, packed 14.45
Carloads, bulk, delivered, per lb of briquet 15.10
Briquets, packed pallets, 2000 lb up to carloads 17.50

Silvery Iron (electric furnace)

Si 15.50 to 16.00 pct., f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $106.50 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $93.00.

Silicon Metal

Cents per pound contained Si, lump size, delivered, packed.

	Ton lots,	Carloads,
98.25% Si, 0.50% Fe..	24.95	22.00
98% Si, 1.0% Fe	24.45	21.50

Silicon Briquets

Cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si, briquets.
Carloads, bulk 8.00
Ton lots, packed 10.80

Electric Ferrosilicon

Cents per lb contained Si, lump, bulk, carloads, f.o.b. shipping point.

50% Si....	14.60	75% Si....	16.90
65% Si....	15.75	85% Si....	18.60
	90% Si....	20.00	

Ferrovanadium

50-55% V delivered, per pound, contained V, in any quantity.
Openhearth 3.20
Crucible 3.30
High speed steel 3.40

Calcium Metal

Eastern zone, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
100 to 1999 lb..	2.40	3.30	4.55

(Effective Jan. 18, 1960)

Alsifer, 20% Al, 40% Si, 40% Fe,

f.o.b. Suspension Bridge, N. Y., per lb.
Carloads, bulk .. .. 9.85¢
Ton lots ..... 11.20¢

Calcium molybdate, 43.6-46.6%

f.o.b. Langeloth, Pa., per pound contained Mo $1.50

Ferrocolumbium, 58-62% Cb, 2 in. x D, delivered per pound

Ton lots $3.45
Less ton lots..... 3.50

Ferro-tantalum-columbium, 20%

Ta, 40% Cb, 0.30% C, del'd ton lots, 2-in. x D per lb con't Cb plus Ta $3.40

Ferromolybdenum, 55-75%, 200-

lb containers, f.o.b. Langeloth, Pa., per pound contained Mo.. $1.76

Ferrophosphorus, electric, 23-26%, car lots, f.o.b. Siglo, Mt.

Pleasant, Tenn., $5.00 unitage, per gross ton $120.00
10 tons to less carload $131.00

Ferrotitanium, 40% regular grade

0.10% C max., f.o.b. Niagara Falls, N. Y., and Cambridge, O., freight allowed, ton lots, per lb contained Ti $1.35

Ferrotitanium, 25% low carbon,

0.10% C max., f.o.b. Niagara Falls, N. Y., and Cambridge, O., freight allowed, ton lots, per lb contained Ti $1.50
Less ton lots $1.54

Ferrotitanium, 15 to 18% high

carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton $255.00

Ferrotungsten, ¼ x down

packed, per pounds contained W, ton lots delivered ..... $2.15 (nominal)

Molybdic oxide, briquets per lb

contained Mo, f.o.b. Langeloth, Pa. $1.49
bags, f.o.b. Washington, Pa., Langeloth, Pa. $1.38

Simanal, 20% Si, 20% Mn, 20%

Al, f.o.b. Philo, Ohio, freight allowed per lb.
Carload, bulk lump ..... 18.50¢
Ton lots, packed lump ..... 20.50¢
Less ton lots ..... 21.00¢

Vanadium oxide, 86-89% V_2O_5

per pound contained V_2O_5 .... $1.38

Zirconium silicon, per lb of alloy

35-40% del'd. carloads, bulk.. 26.25¢
12-15%, del'd lump, bulk-carloads ..... 9.25¢

Boron Agents

Borosil, per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B
2000 lb carload $5.50

Ferro Zirconium Boron, Zr 50% to 60%, B 0.8% to 1.0%, Si 8% max., C 8% max., Fe balance, f.o.b. Niagara Falls, New York, freight allowed, in any quantity per pound ..... 30¢

Corbortam, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4-5-7.5%, f.o.b., Suspension Bridge, N. Y., freight allowed.
Ton lots per pound ..... 18.25¢

Ferroboron, 17.50 min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D, ton lots. . $1.20
F.o.b. Wash., Pa., Niagara Falls, N. Y., delivered 100 lb up
10 to 14% B ..... .85
14 to 19% 1.20
19% min. B 1.50

Grainal, f.o.b. Cambridge, O., freight allowed, 100 lb and over
No. 1 ..... $1.05
No. 79 ..... 50¢

Manganese-Boron, 75.00% Mn, 17.50% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd.
Ton lots (packed) $1.46
Less ton lots (packed) 1.57

Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd less ton lots 2.15

REBUILT—GUARANTEED ELECTRICAL EQUIPMENT

MOTOR GENERATOR SETS

TYPICAL FOR MILL & REEL DRIVES

(2) 3500-K.W. Al. Chal. 5-unit Sets of (2) 1750-KW Gen., 350/700-VDC, (1) 5000-H.P. Syn. Motor, 13800/6900/4160-V., 3 ph., 60 cy. (1) 40-KW & (1) 10-KW Exciters.

(1) 600-K.W. Gen. Elec., 3-unit Set of (2) 300-KW, 250-VDC Gen. & (1) 750-HP Syn. Motor 4160/2300-V., 3 ph., 60 cy. & Magnetic F.V. Starting Cubicles.

(1) 200-K.W. Gen. Elec. 3-unit Set of (2) 100-KW Gen., 250-VDC, B.B. & 300-HP Syn. Motor 2300-V., 3 ph., 60 cy. Mag. F.V. Starting equipment.

STANDARD GENERAL PURPOSE SETS

QU.	KW	MAKE	D.C. VOLTS	A.C. VOLTS
1	2400	G.E.	250	4600/2300
1	1500	G.E.	250	4600/2300
1	1250	G.E.	132/265	4160
2	500	Whse.	280	4000/2300
1	400	G.E.	275	4000/2300
1	300	G.E.	250	4000/2300
4	250	Whse.	250	2300
2	200	G.E.	250/275	4000/2300
2	150	G.E.	250	440
1	125	G.E.	250	440
1	100	G.E.	250	440

(1)—1250-KVA Whse. Hi-Cycle Frequency Set, 800-V., 960 cycle with 1875-HP syn. motor, 2300-V., 3 ph., 60 cy. with all switchgear.

T. B. MAC CABE COMPANY

4302 Clarissa St., Philadelphia 40, Penna.

Cable Address "Macsteel" Philadelphia, Pa.

Phone Davenport 4-8300

FOR SALE

1—3" Rd. Cap. Open End Vertical Bar Shear

1—2¾" Cap. Buffalo Billet Shear

1—5-Roll Abramson Tube Straightener ¾" to 3" O.D. Tube

CURRY & HUDSON ASSOCIATES, INC.

ONE GATEWAY CENTER, PITTSBURGH 22, PA.

VARIABLE VOLTAGE DRIVES

3 PHASE 60 CYCLE

Quan. Size Description

2—3000 HP DC MOTORS—525V., 600 RPM Whse. M.G. Sets—2500 K.W. Whse., 2300/4160 V.

1—2750 HP DC MOTOR 450 V. 300 RPM Elliott 2200 K.W., Gen. Elec. 3 unit 450 V. DC Gen. with 3000 H.P. 720 RPM, 2300 V. AC Motor and Etc.

1—2250 HP DC MOTOR 600 V. 400/500 RPM, G.E. M.G. Set—2000 K.W. G.E. AC Motor—2300 V

1—1500 HP DC MOTOR 600 V. 600 RPM Whse. M.G. Set. 1500 KW G.E. 13200 V.

For listing of Motors, Generators, Transformers, M.G. Sets, Rectifiers, Mill Motors, etc.

See last week issue.

Write — Phone — Wire

BELYEA COMPANY, Inc.

47 Howell St., Jersey City, N. J.

Tel. Oldfield 3-3334

Pittsburgh Sales Up As Strike Ends

Used machine dealers in the Pittsburgh area report a general business pickup since the steel strike ended.

Most items are moving well, but electrical equipment lags.

■ The steel settlement brought a loosening of business for Pittsburgh dealers. Most dealers reported an order improvement and all felt the period of hesitation was ending.

Real Buying Interest—No one is being overwhelmed with business, but a better tone is generally reported. A supplier of steel mill equipment says plans that had been hanging in the fire for months have started moving forward. Before the settlement, prospects would ask for quotations but there was no serious follow-up. Now, there is real buying interest.

In the steel equipment line, a part of the recovery hinges on the fact that mills are now open and machinery can be inspected. But more important is the assurance of continued operations after a year of uncertainty.

General Machines—In the general machinery line, conditions are better but still spotty. One dealer reports a moderate but steady improvement. "Business is a lot better than last year at this time."

But there has been no broad upswing. According to the dealer, interest on saws, drills, shapers and other machine tools. There is no big push for fabricating equipment.

Production Equipment Leads—Another tells about the same story but feels production equipment is leading the way. Customers are asking about presses and other fabricating items rather than toolroom equipment. The difference in the two reports points up the fact that demand is still thin and selective.

Regarding the availability of general machinery, dealers are having their usual problems finding the late models customers want.

"If you can find the right model, there isn't too much quibbling about price," says one supplier. Older machines present price problems.

Cranes Popular—In the materials handling field, interest has perked up since the steel settlement. Dealers are making a few sales and are getting more inquiries. Light and medium duty cranes are attracting the most attention. Heavy equipment still lags. The encouraging thing for suppliers is that there is now action while before there was only waiting.

Electrical equipment has made a disappointing showing so far this year. There was a pickup when the mills resumed operations and there was another improvement when the labor contract was signed.

However, the gain has not been in line with steel mill operating rates or with the level of inquiries. Electrical equipment in this district normally reacts quickly to any change in steel conditions. Today the mills are operating close to capacity but they are not ordering equipment at boom levels.

ROLLING MILLS—STEEL WORKS EQUIPMENT

1—AUTOMATIC COOLING BED FOR BARS up to 2" dia. consists of run-in table, cascade section, shuffle bar section, run-out table, with all electrics, 200 ft. long.

1—32" & 20" x 110" PLATE MILL, 3-high.

1—28" x 40" HOT STRIP MILL, 2-high reversing, with 2500 HP D.C., motor generator, etc.

1—25" & 42" x 60" HOT STRIP MILL, 4-high.

1—24" x 36" 2-HIGH MILL driven by 400 HP motor, 4600/3/60.

1—22" x 36" 2-HIGH MILL driven by 600 HP motor, 4660/3/60.

1—2½" & 8" x 8" COLD STRIP MILL, 4-high.

1—8" x 10" COLD MILL including uncoiler.

2—28" 3-HIGH ROLL STANDS.

1—New 16" BAR MILL, one 3-high roll stand, pinion stand.

1—New 12" BAR MILL, four 3-high roll stands, pinion stand.

1—INDUCTION WELD TUBE MILL, 2" to 8" dia., new 1954.

1—12" MERCHANT BAR MILL with 18" roughing mill and heating furnace.

1—9" BAR MILL, 3-high.

2—MORGAN TRAVELING TILTING TABLES for 24" 3-high bar mill.

1—34" x 192" ROLL GRINDER.

2—65-TON ELECTRIC MELTING FURNACES, TOP CHARGE, with all electrical and mechanical equipment, including 15,000 KVA and 13,333 KVA transformers.

1—New top-charge ELECTRIC MELTING FURNACE with 2000 KVA transformer, 13,200 volts, 3 phase, 60 cycle.

1—72 PLATE PROCESSING & SHEARING LINE, with tables, transfers, and cut and rotary side trimming shears, scales and pliers. Modern, little used.

1—SHEET POLISHING MACHINE. Capacity 48" x 144"

1—ROLL LATHE, ENCLOSED HEADSTOCK, up to 36" dia. rolls.

1—OPEN HEARTH CHARGING MACHINE, 5 ton capacity 11' track gauge.

1—MAGNETIC SEPARATOR double pulley, Stearns.

1—SIDE TRIMMER. Streine, maximum width 48" makes 2 cuts 316" mild steel.

1—SCRAP BALLER, max. size scrap roll 24" O.D. x 24" long.

1—HALLDEN STRAIGHTENING and cutting-off machine, capacity .582" brass rod.

1—POINTER for tube 2" O.D. x ¼" wall maximum.

3—CRANE TONGS for coils, automatic, 30,000 lbs. capacity.

1—1200 HP GEAR DRIVE, 353 to 94.5 RPM 3.73 to 1 ratio.

1—3500 HP MOTOR, 11000/6000 volts, 3 phase, 60 cycle, 514 RPM, synchronous, never used.

FRANK B. FOSTER, INC.

2220 Oliver Building, Pittsburgh 22, Pa.
Cable: "Foster, Pittsburgh" Telephone Atlantic 1-2780

MACHINES FOR YOUR YARD

American car puller
Amer. 50B 3 drum hoist w/slewer
8 CMETCO #202 Rola Paver
5x14 Telsmith Vibro King d.d. screen
Jeep trencher & bulldozer blades
Int. tractor TD-9 w/B-E bulldozer

TRACTOR & EQUIPMENT
10006 Southwest Highway, Oak Lawn, Ill.

FOR SALE
By
STRUTHERS WELLS CORP.

MACHINE TOOLS

1—36" BULLARD VERTICAL TURRET LATHE, 34" Table, Max. 24" Under Rail, 1 Rail 1 Side Head, Ser. 9083

2—NILES TIMESAVER BORING LATHES, Serial 22299, 22300, 33' x 12" diameter maximum depth bore, 20¼" maximum work diameter, 6" maximum bar diameter, spotting carriage, bar supports and tailstock. 25 HP., AC

1—Giddings & Lewis #45 Table Type Horizontal Boring Mill—Serial 8144, 15 HP., DC

1—96' x 72" x 18 Ft. Niles Planer, Ser. 41120, 35 HP., DC Rebuilt 1943.

1—Titusville XL-250 Return Tubular Boiler, 150 P.S.I., 250 HP., complete with oil burners, F.W. pump, trim, etc.

CRANES

1—10 Ton P&H O.E.T. CRANE, cab operated, Serial 10422, lift 14'-11", span 39'-0½". 3 motors, 230 volt DC

1—7½ Ton SHAW O.E.T. CRANE, cab operated, Serial 2416, 3½ ton auxiliary hoist, lift 34'-1", span 40'-8¾", 4 motors, 230 volt DC

1—5 ton SHAW O.E.T. CRANE, cab operated, Serial 1436, lift 11'-2", span 31'-8½", 3 motors, 230 volt DC

ALL THE ABOVE IN GOOD TO EXCELLENT CONDITION MAY BE INSPECTED UNDER POWER

Write—Wire—Phone

STRUTHERS WELLS CORP.
TITUSVILLE, PENNSYLVANIA

RAILWAY EQUIPMENT
USED and RECONDITIONED
RAILWAY CARS and REPAIR PARTS
DIESEL-ELECTRIC LOCOMOTIVES

3, G. E. 44-Ton, 400 H. P., Std. Ga.
1, G. E. 80-Ton, 500 H. P., Std. Ga.
10, 70-Ton COVERED HOPPER CARS
1, 125-Ton RAILROAD TRACK SCALE

IRON & STEEL PRODUCTS, INC.

13496 S. Brainard Ave. Chicago 33, Ill. Ph: Mitchell 6-1212
51-B E. 42nd St. New York 17, N. Y. Ph: YUkon 6-4766

OVER 1,000 NEW AND USED MACHINE TOOLS IN STOCK
WRITE FOR LATEST STOCK LIST

MILES MACHINERY COMPANY

2041 EAST GENESEE • SAGINAW, MICH. PL. 2-3105

---

2 UNUSED
710 KW—250 VOLT D.C. GENERATORS
$7850.00 EACH

Single bearing
Actual photo of units upon request

THE BOSTON METALS CO.

313 E. Baltimore St. ELGIN 5-5050
Baltimore 2, Md. LEXINGTON 9-1900

DIESEL LOCOMOTIVES & CRANES

25 Ton Industrial 60' Boom Crane
12 Gen. Elec. 23, 25, 44, 65 & 80 Ton Diesel Elec. Locos.
2—65 Ton Whitcomb, 1—100 Ton Alcoa & 2—100 Ton Gen. Motors

STANHOPE 60 E. 42nd St., N. Y. 17, N. Y.

---

eastern Rebuilt Machine Tools
THE SIGN OF QUALITY—THE MARK OF DEPENDABILITY

GEAR HOBBING MACHINES
Type A Barber-Colman, m.d.
Type S Barber-Colman, m.d.
Type T Barber-Colman, m.d., 1942
No. 1 Lees Bradner Universal, m.d.
No. 3 Barber-Colman, m.d., 1945
No. 5 Newark Automatic, m.d.
No. 12 Barber-Colman, double overarm, m.d.
No. 34 Brown & Sharpe, m.d., spur & Spiral
No. 130 Cleveland Vertical Rigid Hobber
No. 12H Gould & Eberhardt Universal Mfg. Gear Hobber, m.d.

GEAR TESTERS
FPV-60 Maag Gear Wheel Co. Profile Testing Instrument
12" National Broach & Machine Co.
18" National Broach & Machine Co.
18" Gleason Bevel Gear Tester, m.d.
No. 471 Michigan Tool Co. Hob, Reamer & Gear Checker
National Broach & Machine Co. "Red Ring" Universal Gear Checker

AUTOMOTIVE GRINDERS
No. 76 Van Norman Automatic Piston Turning & Grinding Machine, m.d.
Kwik-Way Model H Piston Turning & Grinding Machine, m.d.

CENTERLESS GRINDERS
No. 2 Cincinnati, m.d., Filmatic Spindle, 1944
No. 3 Cincinnati, m.d.

CRANKSHAFT GRINDERS
22x72" Landis Type CH, m.d., late

CYLINDER GRINDERS
No. 50 Heald, m.d., 1945
No. 73 Heald Airplane Cylinder, m.d., new

EMERY GRINDERS
48" Double End U. S. Electrical Co. Buffer
No. 5D Gardner H. D. Polishing Stand, 1948

DISC GRINDERS
Type 36 FAS Model 102 Standard Elec. Tool Co. Pedestal Grinder, new
Type 10 BAP Model 100, Standard Elec. Tool Co. Pedestal Grinder, new
Type 24 FAS Model 101, Standard Elec. Tool Co. Pedestal Grinder, new
No. 186—36" cap. Gardner, m.d., latest
No. 121 Hanchett Prod. Face Grinder, m.d.

We carry an average stock of 2,000 machines in our 11 acre plant at Cincinnati. Visitors welcome at all times

THE EASTERN MACHINERY COMPANY
1002 Tennessee Avenue, Cincinnati 29, Ohio
MElrose 1-1241 **CABLE ADDRESS—EMCO**

FOR SALE

ONE HOLCROFT COMPLETE CONTINUOUS 1000 LB. PER HR. IN-LINE GAS FIRED RADIANT TUBE CLEAN HARDENING FURNACE 36" WIDE, CAST LINK BELT, GAS FIRED ENDOTHERMIC GENERATOR, CONVEYORIZED QUENCH, AND RECIRCULATING DRAW FURNACE.

We also have other heat treating furnaces & generators.

PAPESCH & KOLSTAD, INC.
Box 3726, 10709 Capital Ave., Oak Park 37, Michigan
Phone: Lincoln 7-6400

SALE OR RENT

25 & 45 Ton G.E. Diesel Electric Locomotives
65 Ton Porter Diesel Electric Locomotive
1—Betts-Bridgeford Axle Lathe
30 & 40 Ton Diesel Locomotive Cranes

B. M. WEISS COMPANY
Girard Trust Bldg. Philadelphia 2, Pa.

PRESS, STRAIGHT SIDE

MODEL SA175 FERRACUTE

500 Ton	100" x 48" Bed Area
Tie Rod	Friction Clutch
Twin Drive	Double Geared
Double Crank	19" Stroke

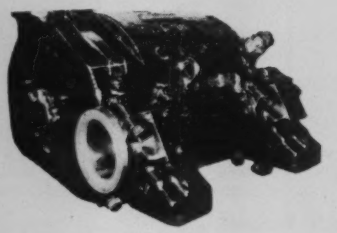
30 H.P. 220/440/3/60 V-belt M.D.

Inspection Under Power

LANG MACHINERY COMPANY, INC.
28th St. & A.V.R.R. Pittsburgh 22, Pa.

WESTINGHOUSE TRACTION MOTORS

New — In Original Crates



Westinghouse type 970-A; part No. 1296204. Max. HP: intermittent—400 HP @ 550 volts —650 amps. Continuous, with blower—300 HP @ 308 volts—325 amps. Max volts 550 DC—max amps 650—max RPM 2000. 4-Pole series motors. Cooling: Can be force ventilated with small centrifugal fans. Air required, 1400 CFM @ 1.3" static pressure. Originally designed for Whitcomb 65-ton diesel electric locomotive.

THE BOSTON METALS CO.
313 E. BALTIMORE STREET
BALTIMORE 2, MD. LE. 9-1900

WORLD'S LARGEST STOCK STAMPING PRESSES

SQUARING SHEARS • PRESS BRAKES
REBUILT *and* GUARANTEED

WILL LEASE WITH OPTION
TO PURCHASE, OR
WILL FINANCE OVER LONG TERM

JOSEPH **HYMAN** & SONS
TIOGA, LIVINGSTON & ALMOND STS.
PHILADELPHIA 34, PA. GArfield 3-8700

IMMEDIATELY AVAILABLE

Because of Mill Consolidation

3 LEE WILSON RECTANGULAR BELL-TYPE ANNEALING FURNACES

atmosphere-controlled with 9 bases, are available. Each is approximately 7' x 7' x 14'. Excellent when used for manufacture of steel coils, they have a capacity of 50 tons per charge. These top-grade furnaces are still set up in the plant. Tremendous values specially priced for prompt sale.

NATIONAL MACHINERY EXCHANGE
126 Mott St. New York 13, N. Y.
CAnal 6-2470

MOTORS—GENERATORS

75 HP CW DC 230V TEFC 900 RPM
500 HP 3/60/440/514 RPM Elec Mach Syn
600 HP West. DC 230V 150-190 RPM
4—1200 KW Allis Chal DC 525V 720 RPM
17—1500 HP West (new) DC 525V 600 RPM

AC to DC MG SETS

60 HP GE 1750-42 KW DC 230V 4 B.B.
125 HP Rel Syn 1200-100 KW DC 230V 3 B.B.
125 HP Elec Prop 1200-75 KW DC 150V 4 B.B.
250 HP West Syn 1200-150 KW DC 125V 3 Sl. B.

ALL SIZE AC & DC
MOTORS & CONTROLS

ALBERT HELLER'S
SHIP SUPPLY CORP.
87 Hamilton Ave. Brooklyn 31, N. Y.
ULster 5-8643

LARGE BILLET SHEAR

Pels Model FV80—All Steel
Capacity: 9¼" Diameter
8⅝" Squares
Equipment: Accurate Stock Gauge
Stock Table
95 H.P. Motor, Controls
Hold Down
13 Sets Blades
Weight about 200,000 lbs.

Built 1943—on Foundation—Inspect Under Power

CADILLAC MACHINERY CO., INC.
814 W. Lake St., Chicago 7, Illinois

10 TO 20 TIMES FASTER

Investigate exclusive Karge Turnomat One Pass Centerless Turning Method. Ten to twenty times faster than centerless grinding . . . unlimited lengths . . . undercuts . . . contours . . . tapers, etc. Bar stock diameter range ⅛" to 3½". Write for full information to:

Contract Dept.

TURNOMAT CO., INC.
BROCKPORT, NEW YORK

NILES ELECTRIC CRANES

1—200 Ton 70 ft. Span
1— 50 Ton 85 ft. Span
3— 10 Ton 49-57-67 ft. Span
All with Cabs

KEYSTONE PLUMBING SUPPLY CO.
275 Chestnut St. Springfield, Mass.

"FASTER FROM FOSTER"
RAIL
& ALL TRACK EQUIPMENT
Nation's Largest Warehouse Stocks
L. B. FOSTER CO.
PITTSBURGH 30 • ATLANTA 8 • NEW YORK 7
CHICAGO 4 • HOUSTON 2 • LOS ANGELES 5

FOR SALE:

LARGE BRAZING FURNACES

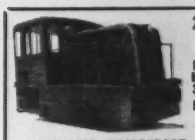
BELL TYPE ELECTRIC BRAZING AND ANNEALING FURNACE: Working dimensions: 48" dia. by 60" high. Has 2350F maximum load temperature, 2550F maximum furnace temperature. Built by General Electric for brazing of stainless steel components in dry hydrogen atmosphere. This new and unused furnace must be sold to clear plant space.

TRAVELING GAS FIRED BRAZING AND ANNEALING FURNACE AND COOLING CHAMBER: Working dimensions: 144" wide by 168" long by 48" high. Has 2150F maximum operating temperature. Rated 7,500,000 BTU per hour. Six zones of control. Cooling chamber is traveling type. Vertically operating doors. This equipment is also new and unused.

For complete details and specifications, write to Dept. F-1, Solar Aircraft Company, San Diego 12, California

FOR SALE
GOSS & De LEEUW CHUCKER
6" x 6¾" CAPACITY
THREADING, CHUCKS, etc.
Very Clean Machine, Ser. #712
GARDEN STATE MACHINERY CORPORATION
440 Frelinghuysen Ave., Newark 12, N. J.

No. 3 Niagara Angle Bending Roll, M.D.
100 KVA Thomson Spot Welder, 24" Throat.
55H Cochrane-Bly 8" Cap. Hyd. Cold Saw.
4K Kearney & Trecker Horiz. Mill, Late Type.
No. ½, No. 1½ Buffalo Univ. Ironworkers, M.D.
600 Ton Southwark Hyd. Inclined Wheel Press.
6' x ¼" Lawn Initial Bending Roll, M.D.
FALK MACHINERY COMPANY
16 Ward St., Baker 5-5887, Rochester 5, N. Y.


25 & 45 T. G.E. DIESEL
ELECTRIC LOCOMOTIVES
New '40-44. Used six mos. by govt. Like new condition. 300&150 HP Cummins engs.
REASONABLE CALL NOW
EVEREADY
BOX 1780, BRIDGEPORT, CONN. EDison 4-9471-2

CONTRACT MANUFACTURING

SMALL
STEEL FABRICATING SHOP
NEEDS WORK
Please write Box 45
Leola, Penna.

This section appears in the 1st and 3rd issue of each month and carries announcements of plants offering specialized experience, facilities, and services.

PIT-MOLDED CASTINGS
. . . a specialty in our MEEHANITE® foundry. We can handle any size casting from 5 to 26,000 pounds, rough or machined to your specifications. (MEEHANITE® properties lie between cast iron and steel.)
Our shops are also equipped for:
- LARGE PATTERN MAKING
- HEAVY PLATE STEEL FABRICATION
- MACHINE SHOP FACILITIES
- PRODUCTION AND ASSEMBLY OF CUSTOM-BUILT MACHINERY

HARDINGE MANUFACTURING CO.
240 Arch Street York, Pennsylvania
Phone 33821

Cure Mounting Production Costs
Internationally-known West Europe industrial concern seeks subcontracting and shopwork orders from American manufacturers. A skilled labor force—modern, well equipped plants—and a complete engineering staff—guarantees superior precision work.
Estimated term production preferred.
TUNING • MILLING • GRINDING • TOOL MAKING
FITTING & ASSEMBLING
When sub-contracting precision work to European concerns import taxes are offset by the low purchase price of raw materials. We also make available to you the services of our Transportation and Purchasing Departments; our Trade Regulations Specialists, and our Tax Consultants. In case of important orders we pay the cost for sending your inspector.
For assistance with your production problems write to
BOX G-998
c/o The IRON AGE, Chestnut at 56th, Phila. 39

Open time for contract work
on the following machines.
Lathe—42" swing—44' centers
36" swing—24' centers
Slotter—60" table—18" stroke
Planer—48" x 14'
Gear Cutter—70" x 24" face
Bronze Foundry—Large Castings
THE WEBB CORP.
WEBB CITY, MISSOURI
Telephone—ORchard 3-4646

THE FORMULA:
Multi-operation presses
plus
Yankee skilled workmen
over
Eighty years manufacturing
know-how equals
Low cost metal stampings
And precision assemblies
To meet your needs
The GREIST MANUFACTURING CO.
646 Blake St., New Haven 15, Conn.

Nepsco
NEW ENGLAND PRESSED STEEL COMPANY
Contract Manufacturer since 1914
METAL STAMPINGS
SPECIALTIES—APPLIANCES
For Industrial and Domestic Users
P. O. BOX 29
NATICK MASSACHUSETTS

K
SINCE 1895
DROP FORGINGS
Small drop forgings up to one pound in size. Inquiries invited for very prompt action.
KEYSTONE FORGING COMPANY
Northumberland Pennsylvania GReenwood 3-3525

SPECIFY MEEHANITE CASTINGS FOR MAXIMUM SERVICE
SPECIAL TYPES FOR RESISTANCE TO ABRASION • HEAT • WEAR • CORROSION
AS CAST OR MACHINED.
Weights: 1—60,000 lbs.
ROSEDALE
FOUNDRY & MACHINE CO.
1731 Preble Avenue • Pittsburgh 33, Pa.
Telephone: CEdar 1-4007

DROP FORGINGS
To Your Specifications
Prompt Quotations
BALDT ANCHOR CHAIN & FORGE DIVISION
P. O. Box 350—Chester, Pennsylvania

METAL STAMPINGS
Send your blueprints for our prompt quotation. Latest brochure sent upon request.
CARLSTROM PRESSED METAL CO., INC.
58 Fisher Street Westboro, Mass

SPECIAL MACHINERY
DIAMITE *Abrasive Resistant* Castings
NI-RESIST *Heat & Corrosion Resistant* Castings
P M G BRONZE *High Strength Acid Resistant* Castings
Fully Equipped—Pattern Foundry & Machine Shop Facilities—Castings to 15 tons
Weatherly Foundry & Mfg. Co., Weatherly, Pa.

DROP FORGINGS
Special Forgings—High Quality, Fast Delivery. For prompt attention phone or send prints to John Bello.
CARCO INDUSTRIES, INC.
7341 Tulip Street, Phila. 35, Pa.
DEvonshire 2-1200

Special Washers
We carry in stock Silicon killed steel specially suited for case-hardening. Stock dies for producing washers from .0015 to ½" thick.
Thomas Smith Company
294 Grove St., Worcester, Mass.

DROP FORGINGS
Special Forgings of Every Description. We solicit your prints or model for quotation.
Wilcox Forging Corporation
Mechanicsburg Penna.

EQUIPMENT AND MATERIALS WANTED

WANTED TO PURCHASE
Metalworking or fabricating plant
REPLIES CONFIDENTIAL
Mr. W. B. WEISS, President
WEISS STEEL CO., INC.
600 W. Jackson Blvd., Chicago 6, Ill.

DRAW BENCHES WANTED
Two 10,000 lb. to 20,000 lb. shape draw benches for non ferrous use. Process length to 45 feet. Chain operated with electrification. Please give full description with reply.
General Ore & Chemical Corp.
417 So. Hill Street, Los Angeles 13, California

SURPLUS STEEL
NEW *WANTED* USED
Structurals, Plate, Pipe and Tubing
Consumers Steel & Supply Co.
P. O. Box 270, RACINE, WISCONSIN

LARGEST BUYERS
in any quantities
OF SURPLUS—NEW & USED
Structurals—All Types of Steel
Pipe—Tubing—Tanks—Boilers
CALUMET IRON & SUPPLY CO.
175 W. Chicago Ave., East Chicago, Ind.

WEISS STEEL CO. INC.
600 WEST JACKSON BLVD.
CHICAGO 6, ILLINOIS
Buyers of Surplus Steel Inventories
39 Years of Steel Service

WANTED SURPLUS STEEL
WALLACK BROTHERS
7400 S. Damen Ave. Chicago 36, Illinois
GROVEHILL 6-7474

PRESSES WANTED
One press or entire stamping or forging plant. Write or phone in confidence.
Wender Presses Inc. TRinity 2-1270
1959 Clay Ave., Detroit 11, Mich.

EMPLOYMENT EXCHANGE

Help Wanted

Salesman—Bolts and Nuts
Territory New England and Eastern New York State. Give details as to past and present employment, age, education and family status—
BOX H-12
c/o The IRON AGE, Chestnut at 56th, Phila. 39

Excellent Employment Opportunity for Engineers with Steel Mill Experience
DRAFTING SUPERVISORS
PIPING ENGINEERS
SPECIFICATION ENGINEERS
ESTIMATORS — DRAFTSMEN
Well-Established Industrial Organization Chicago Location
GOOD SALARIES — FRINGE BENEFITS
PROMOTIONAL OPPORTUNITIES
All replies strictly confidential
If interested send personal resume to
BOX G-997
c/o The IRON AGE, Chestnut at 56th, Phila. 39
Interviews may be arranged in Chicago or Pittsburgh

SALES ENGINEER
Progressive nation-wide Engineering-Construction firm requires the services of a qualified ENGINEER-SALESMAN to contact and sell engineering and construction services to principals of steel producing companies.
Applicant should have a background of steel plant engineering and/or operating experience. Sales background and a wide acquaintance with engineering, operating and procurement officials of the steel industry is desirable.
Assignment of successful applicant will be
IN CHICAGO
where he will enjoy generous life insurance, free family health plan, retirement benefits, moving expenses and other perquisites.
All applications will be acknowledged and held in strictest confidence. Submit detailed resume of experience including references and salary requirements to:
BOX G-999
c/o The IRON AGE, Chestnut at 56th, Phila. 39

TECHNICAL SALESMEN
Graduate Metallurgical or Chemical Engineer. Sales experience desired. Will base in either Pittsburgh or Cleveland area. Please send resume to
KAWECKI CHEMICAL COMPANY
220 East 42nd Street, New York 17, N. Y.

PLANT SUPERINTENDENT
for Structural Steel, Fabricating and Erection Company — 20,000 ton capacity. To take complete charge of fabrication of structural steel for commercial, institutional and industrial buildings in Eastern States. Minimum requirements five years experience, supervising shop employing approximately 100 personnel. Send complete resume, listing all employment, experience, education and salary requirements.
BOX H-11
c/o The IRON AGE, Chestnut at 56th, Phila. 39

METALWORKING PLANT SUPERINTENDENT WANTED
- Top-notch position for high-grade, experienced man; salary open.
- Qualifications: mechanical engineer; age 35-40; sound background in forging, machine shop, finishing, heat-treating, methods, etc.
- Supervise plant of about 200 men; factory and home office in Owatonna.
- OTC—manufacturers of maintenance tools, hydraulic pumps, presses, etc.

All replies confidential
Send resume to: Walter Hertz
OWATONNA TOOL COMPANY
Owatonna, Minnesota

ADVERTISERS IN THIS ISSUE

An asterisk indicates that a booklet, or other information, is offered in the advertisement.

This index is published as a convenience. No liability is assumed for errors or omissions.

A

*Aldrich Pump Co. 13
Allegheny Ludlum Steel Corp. 12
Allen-Bradley Co. 53-54
All-State Welding Alloys Co., Inc. 129
Aluminum Co. of America 38-39
American Welding & Mfg. Co... 102

B

*Babcock & Wilcox Co., Refractories Division 21
*Babcock & Wilcox Co., Tubular Products Div. 4
Baldt Anchor, Chain & Forge Div. 148
Baldwin-Lima-Hamilton Corp., Standard Steel Works Div. 61
Bearings, Inc. 118
Belyea Co., Inc. 144
Bertsch & Co. 122
Bethlehem Steel Co. 1
Boston Metals Co. 145, 146
*Buell Engineering Co., Inc. 100
Bullard Co. 58

C

Cadillac Machinery Co., Inc. 146
Calumet Iron & Supply Co. 148
Capewell Mfg. Co. 11
Carco Industries, Inc. 148
Carlstrom Pressed Metal Co. 148
*Chambersburg Engineering Co. . 121
Cincinnati Milling Machine Co., Grinding Machine Div. 62
Cincinnati Milling Machine Co., Grinding Wheels 34
*Clark Rental Corp. 35
*Cleveland Tramrail Div., Cleveland Crane & Engineering Co. . 131
Consumers Steel & Supply Company 148
*Cooper-Bessemer Corp. 28-29
Curry, Albert, & Co., Inc. 144
*Cyril Bath Co. 42

D

*Danly Machine Specialties, Inc. 73
Dempster Brothers, Inc. 112
Dixie Bearings, Inc. 118
Duraloy Co. 110
Dynapak Convair Div. of General Dynamics Corp. 33

E

Eastern Machinery Co. 145
Eveready Supply Co. 147
Ex-Cell-O Corporation Inside Front Cover

F

Fabrikant Steel Products, Inc. 120, 123
Falk Machinery Co. 147
Foster, Frank B., Inc. 145
Foster, L. B. Company 146

G

Garden State Machine Corp. 147
General Aniline & Film Corp. ... 17
General Ore & Chemical Corp. .. 148
General Steel Castings Corp., National Roll & Foundry Div. .. 127
Gisholt Machine Co. 69
*Goodrich, B. F., Industrial Products Co. 5
Goss & DeLeeuw Machine Co. 122
*Great Lakes Steel Corp. 24-25
Greenlee Bros. & Co. 66
Greist Manufacturing Co., The .. 147
*Gulf Oil Corp. 18-19

H

*Handy & Harman 124
Hardinge Mfg. Co. 147
Heppenstall Co. 80
Hitchiner Mfg. Co., Inc. 107
*Hydraulic Press Mfg. Co. 8
Hyman, Joseph & Sons 146

I

International Nickel Co., Inc. 150
Iron & Steel Products, Inc. 145

J

Jones & Laughlin Steel Corp., Stainless & Strip Div. 56

K

*Kaiser Aluminum & Chemical Corp. 26-27
*Kardong Brothers, Inc. 122
Keystone Forging Company 147
Keystone Plumbing Supply Co. .. 146

L

Lang Machinery Co., Inc. 146
*LaSalle Steel Co. 36
Lassman, Benjamin & Son 119
LeBlond, R. K., Machine Tool Co. 97
Luria Bros. & Co., Inc. 133

M

MacCabe, T. B. Co. 144
Malayan Tin Bureau 72
*Marchant, Geo. F. Co. 123
Miles Machinery Co. 145
*Miller Electric Mfg. Co., Inc. .. 114
Mundt, Chas. & Sons 142

N

National Machinery Exchange 146
National Roll & Foundry Div., General Steel Castings Corp. .. 127
National Steel Corp. 24-25
New England Pressed Steel Co. .. 147
*Northern Engineering Works 16
*Norton Co., Refractories Div. 101

O

Olsen, Tinius, Testing Machine Co. 122
Owatonna Tool Co. 148

P

Pangborn Corp. ... Inside Back Cover
Papesch & Kolstad, Inc. 146
Peterson Steels, Inc. 76

R

Raybestos-Manhattan, Inc., Manhattan Rubber Div. 108-109
*Reliance Electric & Engineering Co. 32
*Republic Steel Corp. 30-31
Revere Copper & Brass, Inc. ... 78-79
Rosedale Foundry & Machine Co. 147

S

Sharon Steel Corp. 74-75
Ship Supply Corp. 146
Signode Steel Strapping Co. 70
*Simonds Abrasive Co. 77
Simonds Gear & Manufacturing Co. 120
Smith, Thomas Co. 148
Solar Aircraft Co. 146
Southern Screw Co. 15
Stanhope, R. C., Inc. 145
Standard Steel Works Div., Baldwin-Lima-Hamilton Corp. .. 61
Struthers Wells Corp. 145
Sun Shipbuilding & Dry Dock Co. 142
*Sylvania Electric Products Inc., Chemical & Metallurgical Div. 10

T

*Taylor Fibre Co. 22-23
Thompson, Henry G., & Sons Co. 64
Timken Roller Bearing Co., Back Cover
*Tinnerman Products, Inc. 113
Tractor & Equipment Co. 145
Treadwell Engineering Co. 111
Turnomat Co., Inc. 146

U

Union Carbide Metals Co., Div. of Union Carbide Corp. 40
*United Engineering & Foundry Co. 117
Universal-Cyclops Steel Corp. ... 105

V

*Valvoline Oil Co. 99
Vanadium-Alloys Steel Co. 14
Vascoloy-Ramet Corp. 20

W

Wallack Bros. 148
Ward Steel Co. 120
Warner & Swasey Co. 6
Weatherly Foundry & Mfg. Co. .. 148
Webb Corp. 147
Weiss, B. M. Co. 146
Weiss Steel Co., Inc. 148
Wender Presses, Inc. 148
*Whiting Corp. 37
Wilcox Forging Corp. 148

Y

*Yoder Co. 98
*Youngstown Foundry & Machine Co. 115

CLASSIFIED SECTION

Clearing House 144-147
Contract Manufacturing Appears in first and third issue of each month. See 147-148
Employment Exchange 148
Equipment & Materials Wanted .. 148

The IRON AGE Chestnut & 56th Sts., Philadelphia 39, Pa.

Please send me rates and general information about the Classified Section without obligation on my part.

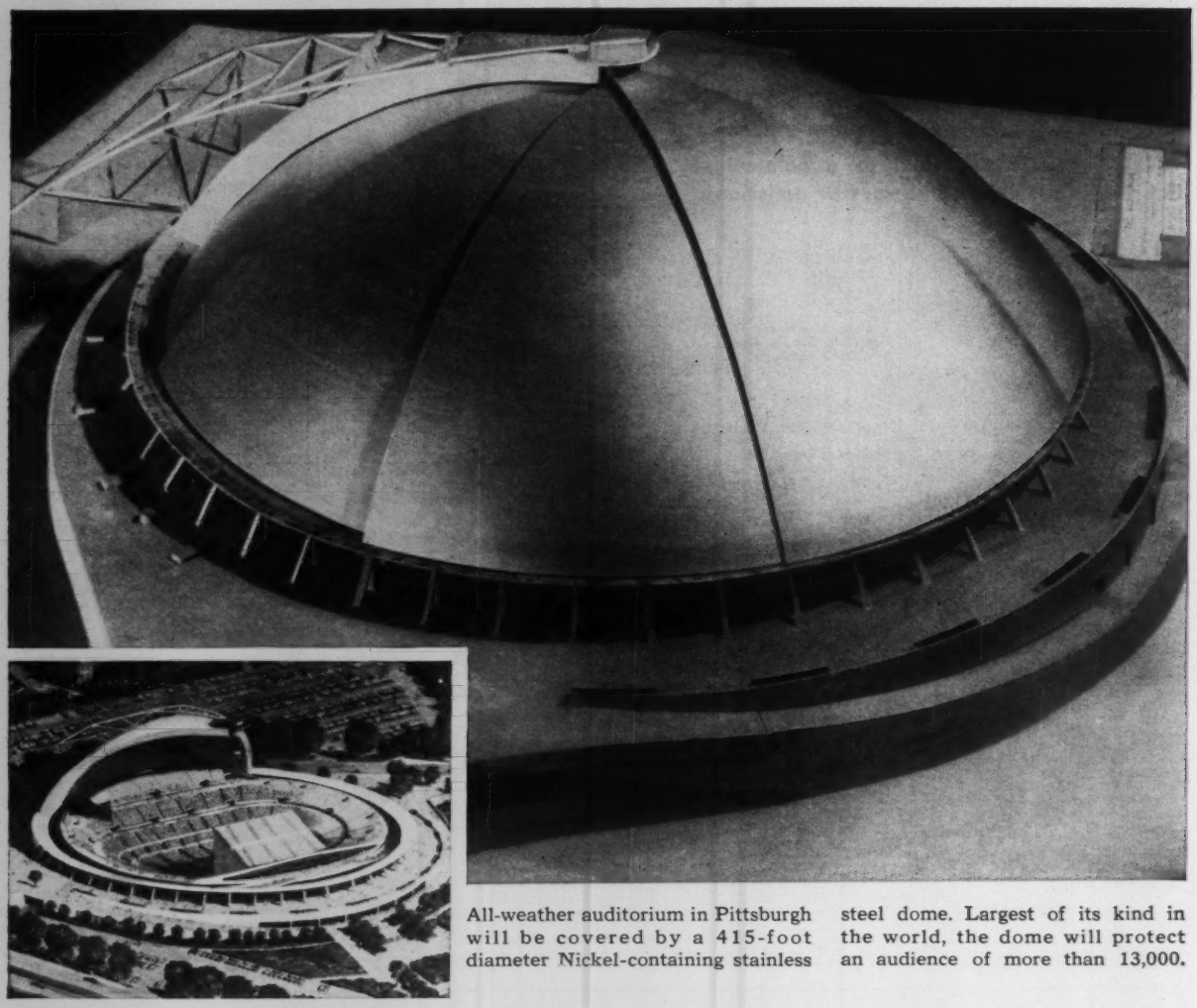
Name ..... Title .....

Company .....

Street .....

City ..... Zone..... State .....

I am interested in The Clearing House ☐, Equipment and Materials Wanted ☐, Employment Exchange ☐, Contract Manufacturing ☐.



All-weather auditorium in Pittsburgh will be covered by a 415-foot diameter Nickel-containing stainless steel dome. Largest of its kind in the world, the dome will protect an audience of more than 13,000.

"Push-button umbrella roof" of stainless steel gives Pittsburgh a new all-weather auditorium

Watching a play or listening to music under the stars heightens the enjoyment. That is, until a passing shower comes along to wash out the fun. But now comes a new idea in auditoriums. In this one, an umbrella roof of Nickel-containing stainless steel will close at the first drops of rain—and on with the show.

It's a simple concept, but a daring one. Eight huge sections nest together when the dome is open. Push a button, and six of these sections glide quietly together around an outside track.

They looked into all sorts of sheathing materials in designing the dome before choosing stainless – a Nickel-containing stainless steel.

For stainless with Nickel in it is one of the most weatherproof metals there is. It is corrosion-resisting all the way through – in salt air as well as industrial atmospheres. What's more, it's virtually self-cleaning – rainfall alone keeps this metal clean.

No wonder you see Nickel-containing stainless wherever strength, long life and handsome appearance are called for! Not only in buildings – inside and out – but everywhere you look.

Suggest something to you? Can stainless help you solve a problem involving corrosion, stress, appearance, temperature extremes? The way to find out is to write us. We'll see if Nickel-containing stainless steel – or some other nickel alloy – may be just what you're looking for.

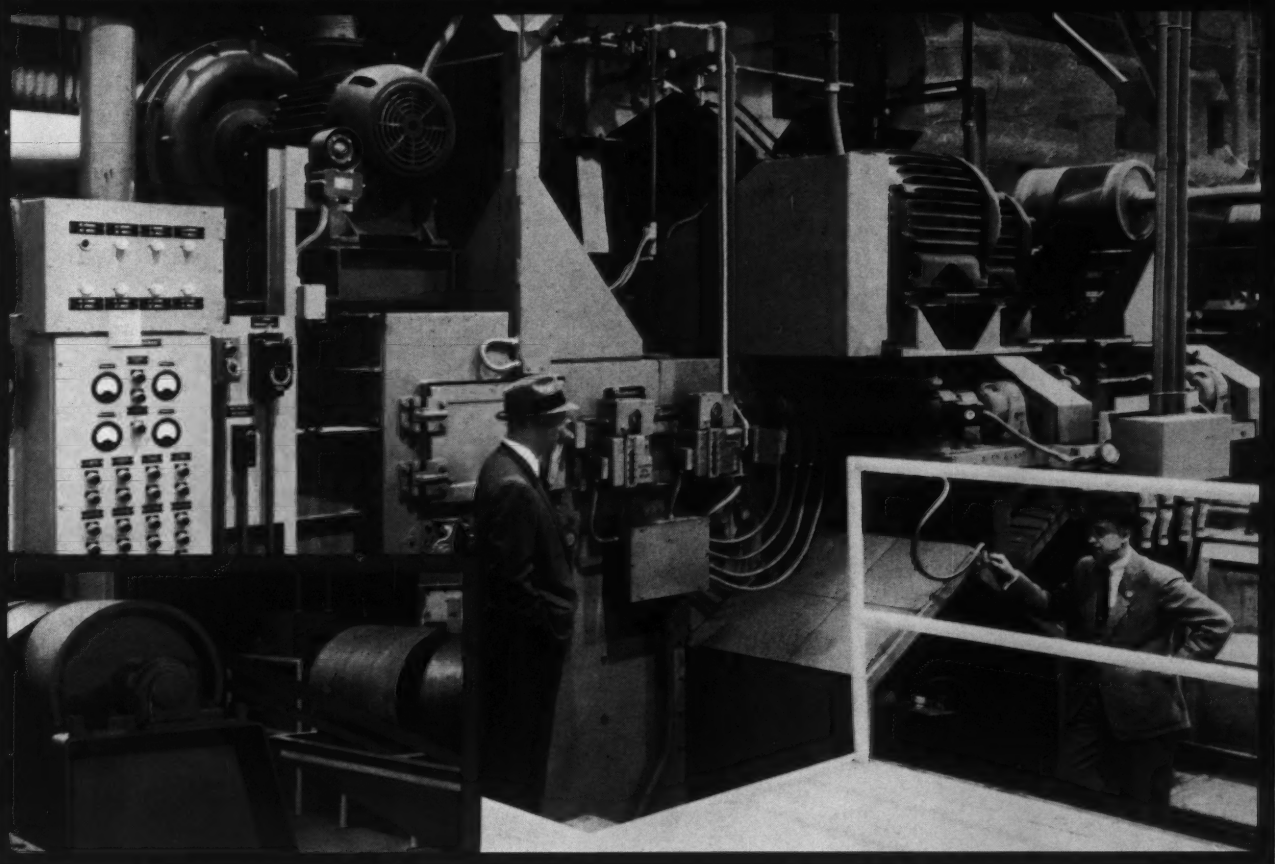
THE INTERNATIONAL NICKEL COMPANY, INC.

67 Wall Street INCO New York 5, N. Y.

INCO NICKEL

NICKEL MAKES ALLOYS PERFORM BETTER LONGER

PUSH-BUTTON DESCALING WITH ROTOBLAST!



Universal Cyclops uses Pangborn Rotoblast Descaling for flexibility in automation

Devoted entirely to the production of cold rolled stainless steel strip, the new Coshocton, Ohio plant of Universal Cyclops Steel Co. is one of the most completely modern plants in the country.

Among its advanced equipment, the company uses a Pangborn Rotoblast Descaling Machine in a 659 ft. fully-automated line. This machine—requiring no operator—continuously blast cleans two strands of steel simultaneously at speeds up to 80 LFM. To provide a high degree of flexibility, it has individual strand control and permits changing the position of Rotoblast wheels at the touch of a button. Abrasive velocity and volume are also variable and two-speed motors give a choice of 50 h.p. at 1200 RPMs or 75 h.p. at 1800 RPMs, depending on type and thickness of work.

Rotoblast's efficiency and adaptability to individual descaling problems have proved the value of Rotoblast to Universal Cyclops. They can in your plant. For more information, talk to the Pangborn man in *your* area or write PANGBORN CORPORATION, 1500 Pangborn Blvd., Hagerstown, Md. *Manufacturers of Blast Cleaning and Dust Control Equipment—Rotoblast Steel Shot and Grit.*

Pangborn

Cleans it fast with **ROTOBLAST**®

Time, power, maintenance saved on Blaw-Knox two-high slabbing mill

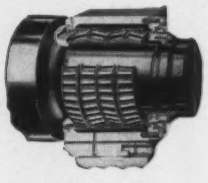
BLAW-KNOX wanted to be sure this new 46″ x 90″ 2-high slabbing mill would work steadily, economically, under tremendous shock loads. They mounted roll necks, screwdowns, edger, edger drives, table drives and table line shaft on Timken® tapered roller bearings.

Result: *Less downtime* in roll changes; the Timken bearings and roll assembly can be removed easily as a unit; *low starting resistance* and less power required because Timken bearings practically eliminate friction; *reduced maintenance* on screwdown and breaker block, because Timken bearings hold the upper roll in place, eliminating the "jump" when slab or bloom enters the mill.

More than 1,000 mill installations the world over use Timken roll neck bearings, 1) *To roll the load*—virtually eliminate friction. Timken bearings have tapered design to take both radial and thrust loads. 2) *Minimize maintenance:* Modern Timken roll neck bearings are designed to provide the best combination of bearing capacity, rigidity and roll neck strength for a given mill roll diameter. Bearings and roll necks stand up longer under load. Grease or oil mist lubrication provides further economies. And, 3) *give longer bearing life.* Mill records show that service life of Timken back-up roll bearings has been obtained in excess of 12,000,000 tons of steel rolled. The full-line contact between rollers and races gives them extra load-carrying capacity.

For the best bearing performance and engineering service when you build or buy a mill, specify Timken tapered roller bearings. They make any machine better. ***When you buy Timken bearings you get...*** *1) Quality you can take for granted. 2) Service you can't get anywhere else. 3) The best-known name in bearings. 4) The pace setter in lower bearing costs.* The Timken Roller Bearing Company, Canton 6, Ohio. *Makers of Tapered Roller Bearings, Fine Alloy Steels and Removable Rock Bits.* Canadian plant: St. Thomas, Ontario, Cable address: "TIMROSCO".

BETTER-NESS rolls on

TIMKEN®

tapered roller bearings